MODEL 420-S-399

TRANSMISSION LEVEL TEST SET

WAVETEK
SAN DIEGO

9045 BALBOA AVENUE, SAN DIEGO, CALIFORNIA

MODEL 420-S-399

TRANSMISSION LEVEL TEST SET

This model contains Options A and B plus a special feature. The transmitter can be terminated in 72Ω by depressing the 72Ω TRANSMIT IMPEDANCE pushbutton on the front panel.

WAVETEK®
SAN DIEGO
9045 Balboa Ave., San Diego, CA 92123
P. O. Box 651, San Diego, Calif. 92112
Tel 714/279-2200 TWX 910-335-2007

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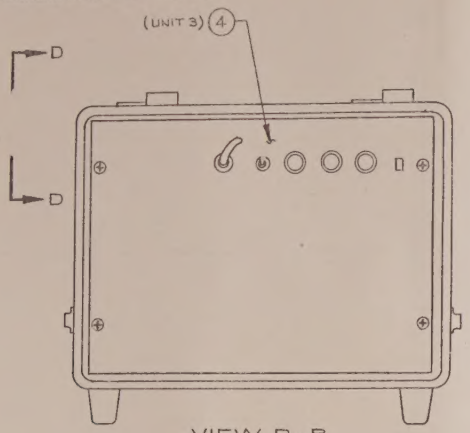
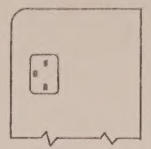
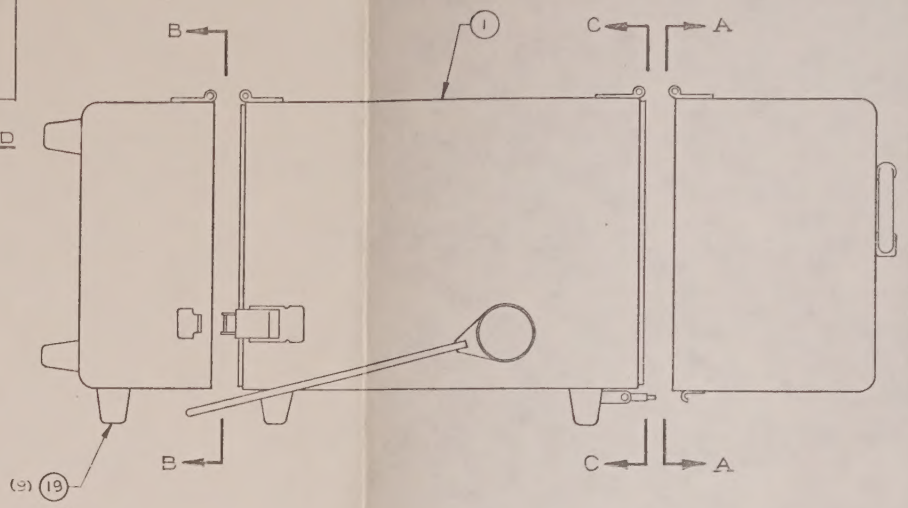
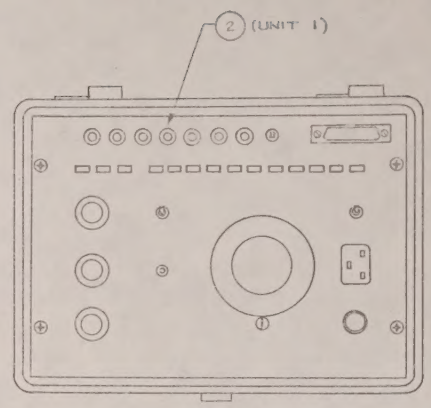


VIEW B-B

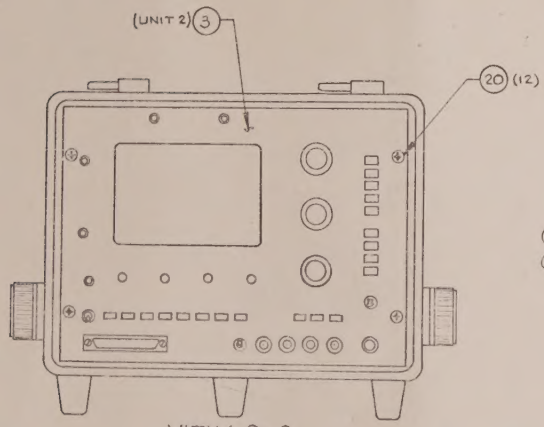


VIEW D-D

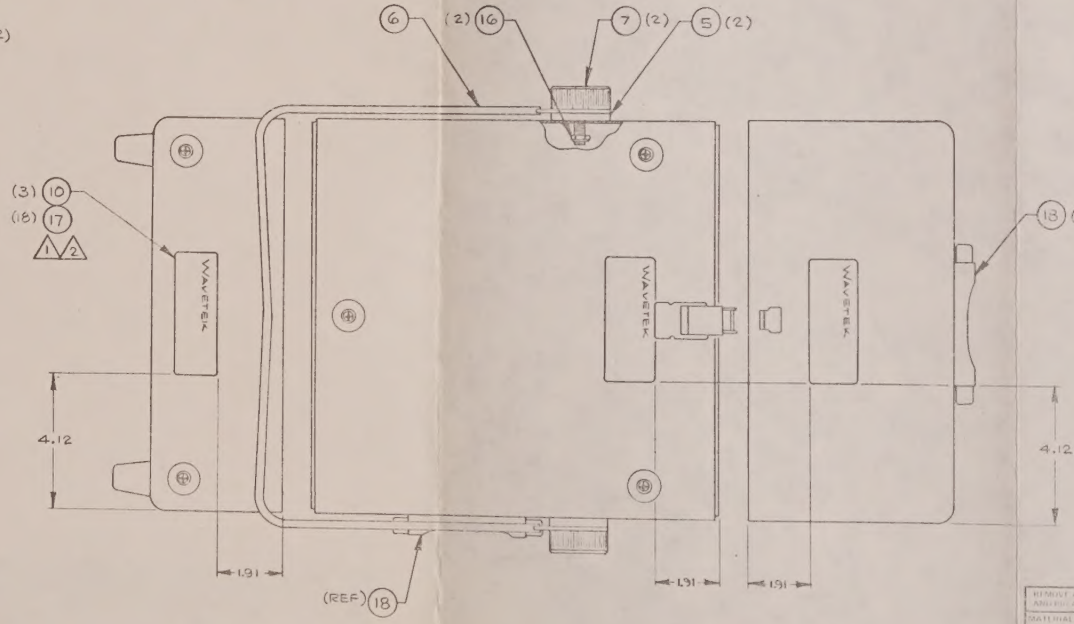




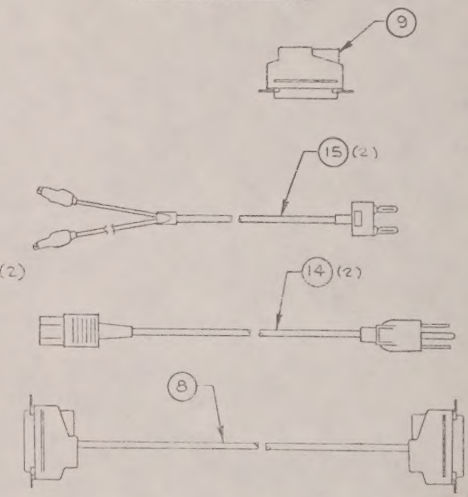
VIEW A-A



VIEW C-C



ACCESSORIES



ACCESSORIES
(NOT SHOWN)
11 ACCESSORY BAG (1)

△1 METAL STAMP MODEL NUMBER (420-S-399) & SERIAL NUMBER ON I.D. PLATES.

△2 MATCH DRILL (.093 (3/32) DIA HOLE) THRU I.D. PLATE & CASE IN ALL POSITIONS (18 PLACES).

NOTE: UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS & AMERICAN SHARP EDGES	DRAWN: E.A. REDMAN	DATE: 4-21-4	WAVETEK SAN DIEGO, CALIFORNIA
MATERIAL: —	FINISH: —		TITLE: ASSEMBLY, TRANSMISSION LEVEL TEST SET
—	RELEASE APPROVAL		
	CONTRACT NO.		
	SCALE: 1/2		420-S-399 D398-010

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REV	ECN	BY	DATE	APP

PARTS LIST

LINE NO.	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	INSTRUMENT CASE	WAVETEK	23338	D420-500	1
2	TRANSMITTER	WAVETEK	23338	D398-011	1
3	RECEIVER	WAVETEK	23338	D420-002	1
4	POWER SUPPLY	WAVETEK	23338	D420-003	1
5	PIVOT BASE	WAVETEK	23338	B420-309	2
6	BAIL	WAVETEK	23338	B420-315	1
7	RETAINER	WAVETEK	23338	B420-308	2
8	CABLE, INTERCONNECT ASSY	WAVETEK	23338	B420-420	1
9	INTERLOCK CONN ASSY	WAVETEK	23338	B420-421	1
10	I.D. PLATE	WAVETEK	23338	B147-334	3
11	BAG, ACCESSORY	WAVETEK	23338	B420-362	1
12					
13					
14	POWER CORD	BELDEN	16428	17250	2
15	INPUT CABLE	POMONA	05276	2BC-MG-48	2
16	NUT, SELF LOCKING	SPS	56878	21FKF-616	2
17	POP RIVET (1/8 GRIP)	USM	07707	AD32-AB5	18
18	HANDLE (BLACK & NICKEL PLATED)	PHILADELPHIA HANDLE CO.	12136	3150-305-304	1
19	MTG FOOT	ROYAL IND.	98388	2097W-475	9
20	WASHER, FLAT #6 NYLON	COML			12

NOTE: UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND BREAK SHARP EDGES
MATERIAL
FINISH WAVETEK PROCESS
DRAWN B. REDMAN DATE 9/14/72
ENGINEER
RELEASE APPROV
TOLERANCE UNLESS OTHERWISE SPECIFIED XXX ± .010 ANGLES ± 1° XX ± .030
DO NOT SCALE DWG
SCALE

WAVETEK SAN DIEGO, CALIFORNIA

TITLE ASSEMBLY, TRANSMISSION LEVEL TEST SET

MODEL NO 420-S-392
DWG NO B398-010
REV
CONT IDENT 23338
SHEET 2 OF 2

B398-010

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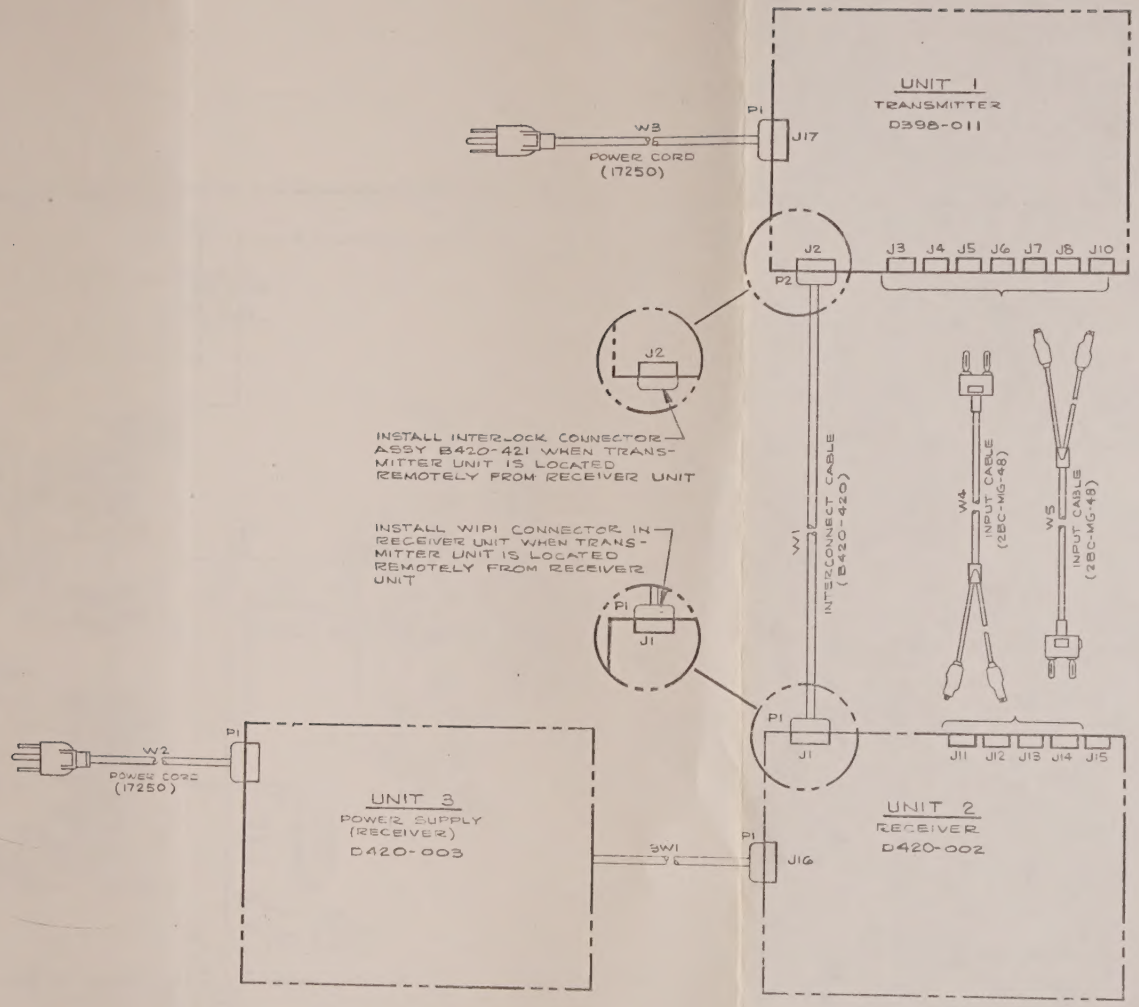

UNIT 1 SUBASSEMBLIES
1A1 - TRANSMITTER MAIN BD
1A2 - ATTENUATOR BD
1A3 - SWEEP GENERATOR BD
1A4 - BATTERY CHARGER BD
1A5 - BATTERY ASSY

UNIT 3 SUBASSEMBLIES
3A1 - BATTERY CHARGER BD
3A2 - BATTERY ASSY

UNIT 2 SUBASSEMBLIES
2A1 - RECEIVER MAIN BD
2A2 - ATTENUATOR BD
2A3 - HIGH VOLTAGE BD
2A4 - INTERFACE BD
2A5 - CATHODE RAY TUBE ASSY
2A6 - NOISE BOARD

NOTE UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND BREAK SHARP EDGES	DRAWN M. TECHMAN 8/2/74	WAVETEK SAN DIEGO, CALIFORNIA	
MATERIAL —	PROJECTION 3rd	TITLE SCHEMATIC DIAGRAM, CHASSIS (INTERCONNECT)	
FINISH WAVETEK GRAY	RELEASED APPROVAL		
	TOLERANCE UNLESS OTHERWISE STATED .XX ±.01 .XXX ±.005 ANGLES ±1°		
	TAPERED SCALE 1:1	SIZE 4.0-5-249	DRAWING NO. D398-210 REV.
	SHEET —	2.33.08	SHEET — OF —

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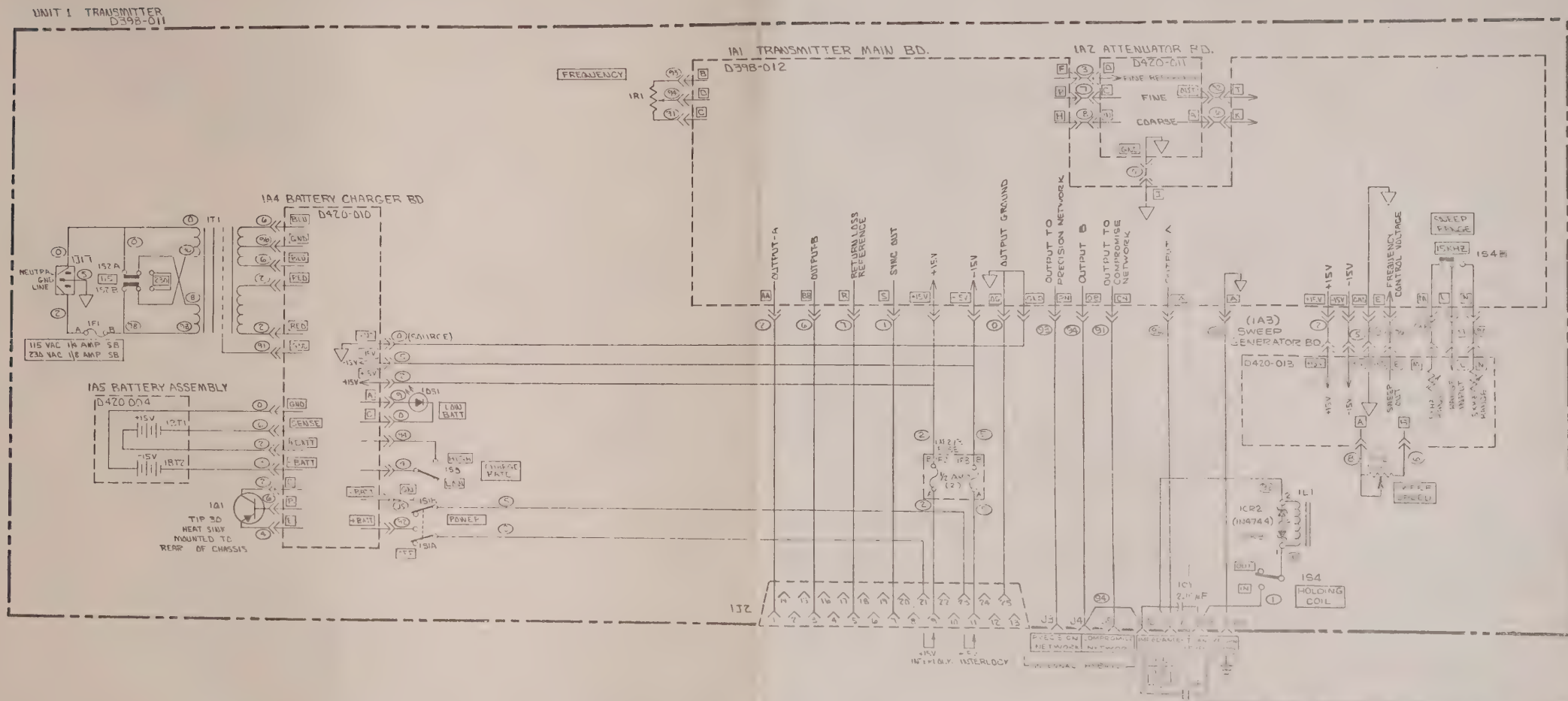
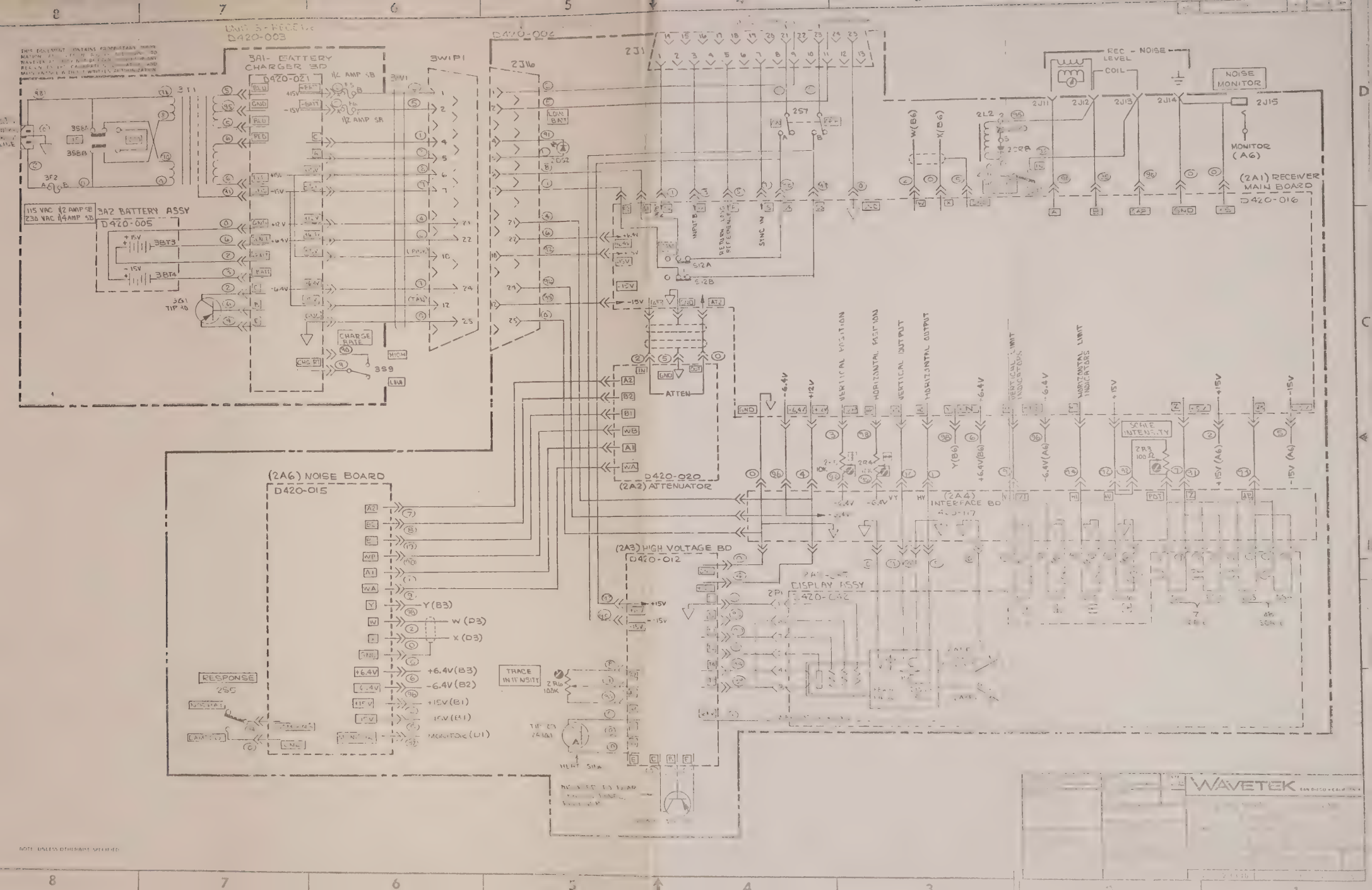


NOTE: UNLESS OTHERWISE SPECIFIED

WAVETEK


UNIT 5 RECEIVER
D420-003
3A1- BATTERY CHARGER 3D
D420-021
3A2 BATTERY ASSY
D420-005
115 VAC 1/2 AMP SB
230 VAC 1/4 AMP SB
3BT3
3BT4
3G1
TIP 42
CHARGE RATE
3S9
3W1P1
2J1
2J16
2S7
LOW BAT
D52
S12A
S12B
ATTEN
D420-020
(2A2) ATTENUATOR
(2A6) NOISE BOARD
D420-015
RESPONSE
2S6
TRACE INTENSITY
2R6 100K
TIP 29
2Q3A1
HEAT SINK
(2A3) HIGH VOLTAGE BD
D420-012
(2A4) INTERFACE BD
D420-017
DISPLAY ASSY
D420-032
SCALE
INTENSITY
2R3 100Ω
2R4 10K
2R5 10K
REC - NOISE LEVEL
COIL
NOISE MONITOR
2J11
2J12
2J13
2J14
2J15
MONITOR (A6)
2L2
2CR8
W(B6)
X(B6)
(2A1) RECEIVER MAIN BOARD
D420-016
INPUT B
RETURN LOOP REFERENCE
SYNC W
VERTICAL POSITION
HORIZONTAL POSITION
VERTICAL OUTPUT
HORIZONTAL OUTPUT
VERTICAL LIMIT INDICATORS
HORIZONTAL LIMIT INDICATORS
Y(B3)
W(B3)
X(B3)
+6.4V(B3)
-6.4V(B2)
+15V(B1)
-15V(B1)
MONITOR(D1)
+6.4V(B6)
-6.4V(A6)
+15V(A6)
-15V(A6)
WAVETEK

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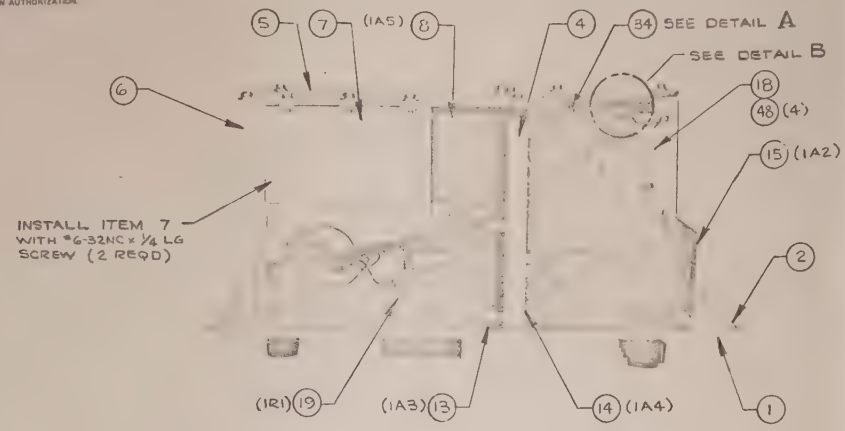
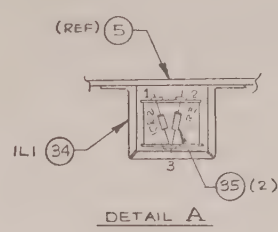
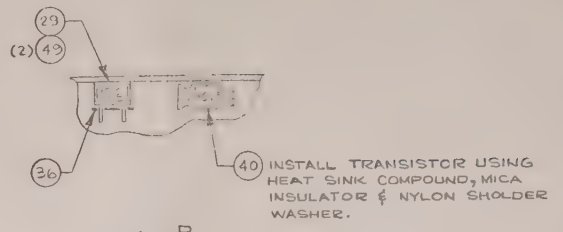
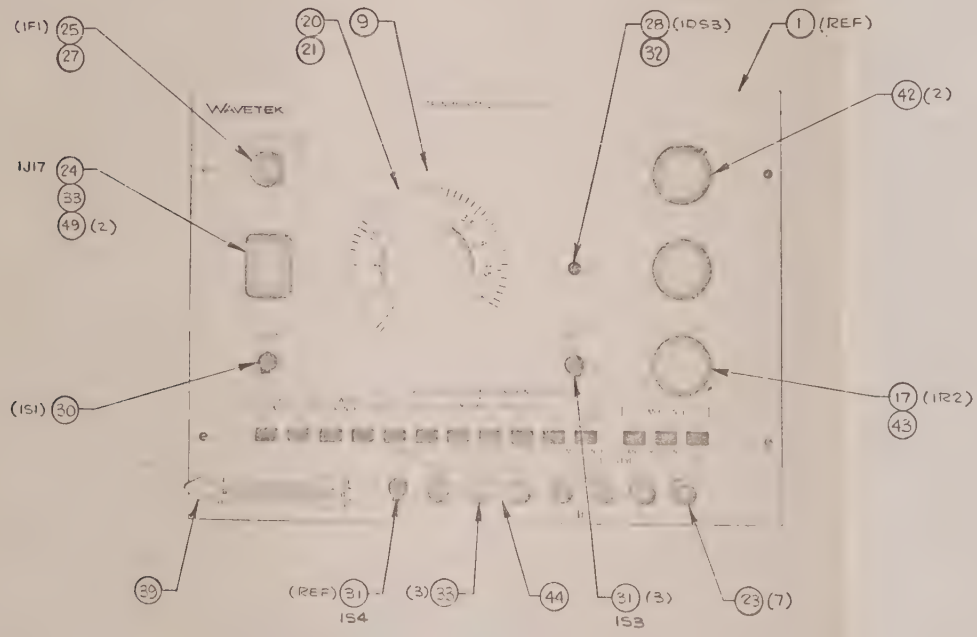


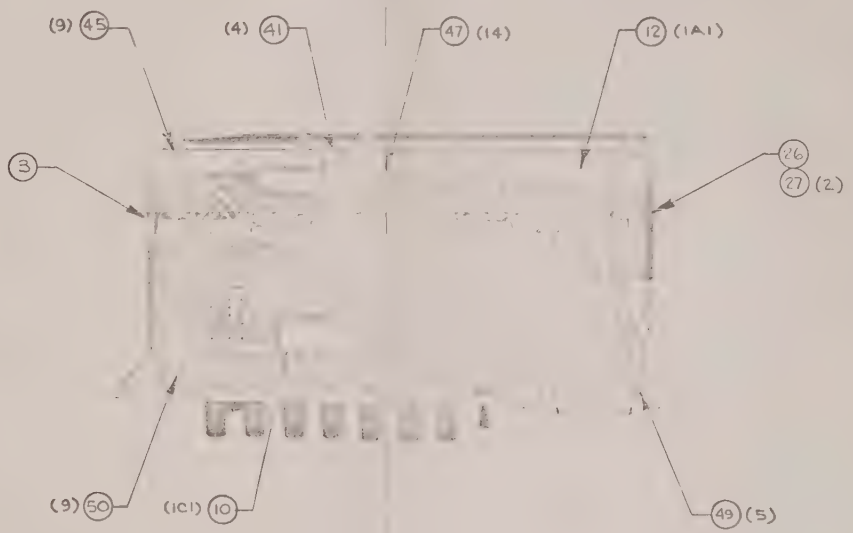


DETAIL A



DETAIL B





1. ALL LOCK WASHERS MUST BE SPRING (SPLIT) LOCK TYPE.

NOTE: UNLESS OTHERWISE SPECIFIED

REV	ALL BOARDS	B. REDMAN	WAVETEK
			ASSEMBLY, TRANSMITTER (UNIT 1)

8 7 6 5 4

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PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	FRONT PANEL	WAVETEK	23338	C398-310	1
2	SUB PANEL	WAVETEK	23338	C420-301	1
3	CHASSIS ASSY, HORIZ	WAVETEK	23338	C420-319	1
4	CHASSIS, VERT	WAVETEK	23338	C420-320	1
5	REAR PANEL	WAVETEK	23338	C420-318	1
6	BAR, SUPPORT	WAVETEK	23338	A420-323	1
7	BRACKET, BATTERY	WAVETEK	23338	C420-322	1
8	BATTERY ASSY	WAVETEK	3338	C420-004	1
9	INDICATOR, DIAL	WAVETEK	23338	B110-338	1
10	CAPACITOR	AMERICAN RADIONICS	07994	A420-505-81	1
11					
12	MAIN BOARD	WAVETEK	23338	D398-012	1
13	SWEEP GENERATOR BD	WAVETEK	23338	D420-013	1
14	BATTERY CHARGER BD	WAVETEK	23338	D420-010	1
15	ATTENUATOR ASSY	WAVETEK	23338	D420-011	1
16					
17	POTENTIOMETER	WAVETEK	23338	A420-410	1
18	TRANSFORMER	WAVETEK	23338	B110-500	1
19	POTENTIOMETER	WAVETEK	23338	A131-R1	1
20	DIAL BLANK	WAVETEK	23338	B130-333	1
21	DIAL KNOB	WAVETEK	23338	A130-325	1
22					
23	BINDING POST	SUPERIOR	58474	DF218C	7
24	A.C. POWER RECEPTACLE	SWITCHCRAFT	82389	EAC-301	1
25	FUSE HOLDER	LITTLEFUSE	75915	342012	1
26	FUSE BLOCK	LITTLEFUSE	75915	357002	1
27	FUSE 1/4 AMP S.B.	LITTLEFUSE	75915	313.250	3
28	LED	OPCOA		OSL-6L-1	1

PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
29	SWITCH 115/230	SWITCHCRAFT	82389	46256LF	1
30	SWITCH DPDT	C & K	09353	7201-PDCN	1
31	SWITCH SPDT	C & K	09353	7101-PDCN	2
32	LED MTG KIT	OPCOA		OC1	1
33	SOLDER LUG	H.H. SMITH	83330	1414-4	1
34	HOLDING COIL	WAVETEK	23338	B420-525	1
35	DIODE, ZENER	I.R.	81483	1N4744	2
36	SOLDER GUARD	SWITCHCRAFT	82389	46256-LFSG	1
37	TRANSISTOR TIP-30	TI	01295	TIP 30	1
38					
39	SPRING LATCH ASSY	CANNON	31746	D110277	1
40					
41	GROMMET	H. H. SMITH	83330	2175	4
42	KNOB, SKIRTED BAR	RAYTHEON	94144	708-3-2G	2
43	KNOB, SKIRTED	RAYTHEON	94144	70-3BL-2G	1
44	SHORTING BAR	SUPERIOR	58474	938-L	1
45	SPEED NUT	TINNERMAN	78553	C880-632	9
46					
47	SCREW, SELF LOCKING	LONG-LOK	16941	LP-35206-227	14
48	SCREW, 86-32 X 1 1/2 LONG	COML			4
49	NUT, SELF LOCKING 84-40	SPS	56878	21FA-440	5
50	NUT, SELF LOCKING 86-32	SPS	56878	21FA-632	9

NOTE UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND BREAK SHARP EDGES
MATERIAL
FINISH WAVETEK PROCESS
DRAWN B. REDMAN DATE 4/4
PROJ ENGR D.A.
RELEASE APPROV
TOLERANCE UNLESS OTHERWISE SPECIFIED XXX ± .010 ANGLES ± 1 XX ± .030

WAVETEK SAN DIEGO, CALIFORNIA

TITLE
ASSEMBLY, (TRANSMITTER)

B398-011

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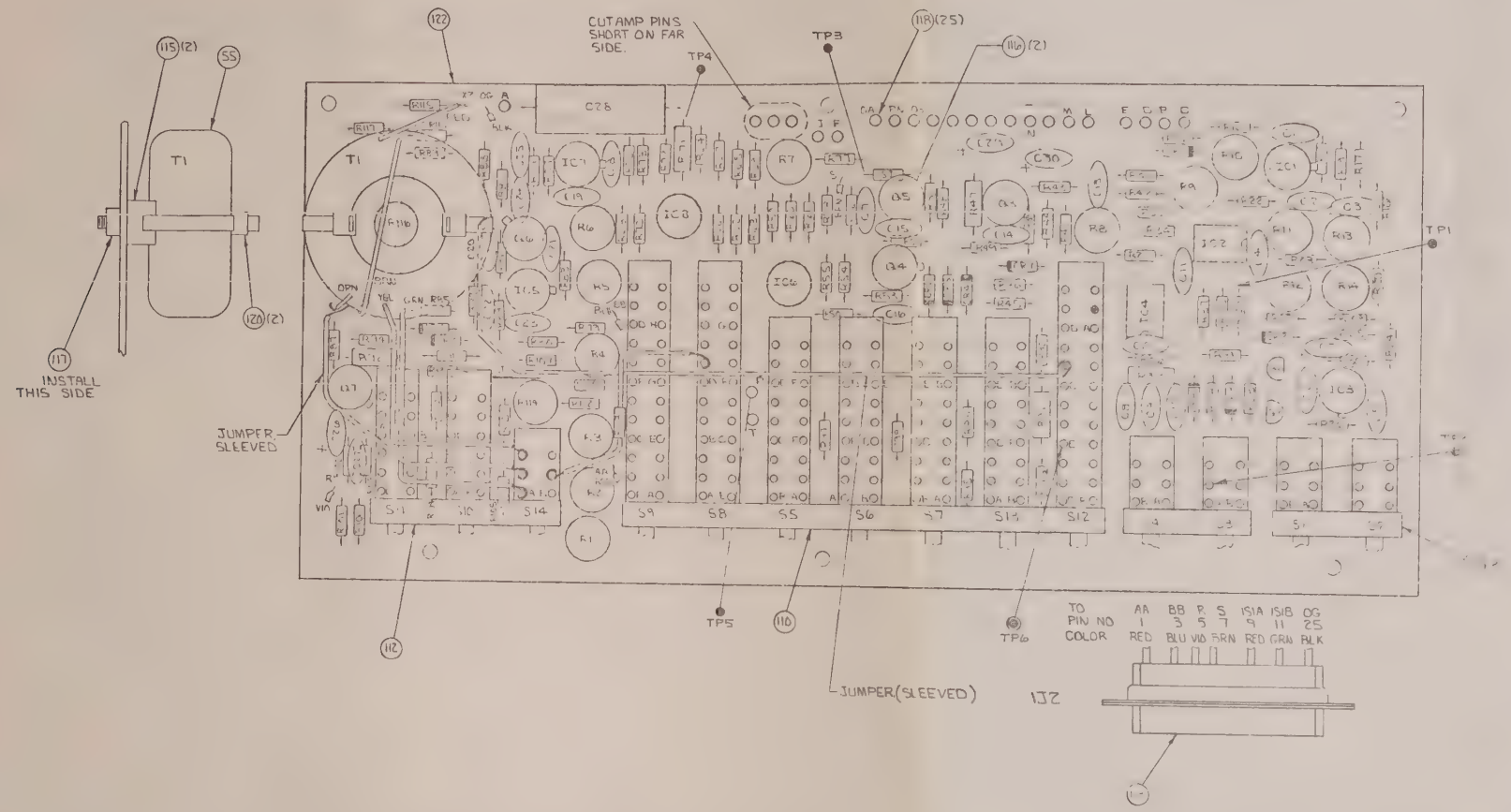

1. 10K MATCHED RESISTORS (ITEM 103) ARE TO BE INSTALLED AS FOLLOWS: R24 & R30; R61 & R63; R67 & R70.

NOTE UNLESS OTHERWISE SPECIFIED

MATERIAL	B. KRISMAN		WAVETEK SAN DIEGO, CALIFORNIA
			ASSEMBLY MAIN BOARD (AT) TRANSMITTER

8 7 6 5

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PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	CAPACITORS				
2	CERAMIC DISC 1000V 10PF	CRL	71590	DD100	1
3	CERAMIC DISC 1000V 33PF	CRL	71590	DD330	2
4	CERAMIC DISC 1000V 47PF	CRL	71590	DD470	6
5					
6					
7	CERAMIC DISC 1000V 330PF	CRL	71590	DD331	1
8	CERAMIC DISC 1000V 220PF	CRL	71590	DD221	2
9	SILVER MICA 500V 1% 910PF	ARCO	02799	DMI5-911F	3
10					
11	CERAMIC DISC 1000V 10%.001µF	CRL	71590	DD102	4
12	CERAMIC DISC 50V 10%.005µF	CRL	71590	CK502	2
13	CERAMIC DISC 1000V 10% .01µF	CRL	71590	CK103	2
14	MYLAR 2.15µF ±1%	AMERICAN RADIONICS	07994	WAVETEK 2MFW-205K (-82)	1
15					
16	TANTALUM, 35V 27µF	SPRAGUE	56289	196D276X0035F6	6
17					
18					
19					
20					
21					
22	DIODES				
23	DIODES 6.4V ZENER	DICKSON	12954	IN4581	1
24	DIODES FD6666	FAIRCHILD	33888	FD6666	7
25	DIODES (MATCHED SET)	DICKSON	12954	IN4581 (-83)	2
26					
27					
28	INTEGRATED CIRCUITS				

PARTS LIST

LINE NO.	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
29	INTEGRATED CIRCUITS µA709C	FAIRCHILD	33888	µA709 (-13)	4
30	INTEGRATED CIRCUITS LM301AN	NATIONAL	27014	LM301AN	2
31	INTEGRATED CIRCUITS CA3019	RCA	86684	CA3019	2
32					
33					
34					
35	POTENTIOMETERS				
36	POTENTIOMETERS 100Ω	BECKMAN	80740	91AR100Ω	1
37	POTENTIOMETERS 1K	BECKMAN	80740	91AR1K	3
38	POTENTIOMETERS 5K	BECKMAN	80740	91AR5K	5
39	POTENTIOMETERS 10K	BECKMAN	80740	91AR10K	2
40	POTENTIOMETERS 100K	BECKMAN	80740	91AR100K	4
41	POTENTIOMETERS 500Ω	BECKMAN	80740	91AR500Ω	1
42					
43					
44	TRANSISTORS				
45	TRANSISTORS 2N2219A	MOTOROLA	04713	2B2219A	1
46	TRANSISTORS 2N2905A	FAIRCHILD	33888	2N2905A	1
47	TRANSISTORS 2N3638	FAIRCHILD	33888	2N3638	2
48	TRANSISTORS 2N5458	MOTOROLA	04713	2N5458	1
49	TRANSISTORS 2N5461	MOTOROLA	04713	2N5461	1
50	TRANSISTORS	TECH PROD		TP605	1
51					
52					
53					
54	TRANSFORMER				
55	TRANSFORMER 61571	WAVETEK	23338	B398-510	1
56					
57					

PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P N	QTY
58					
59	RESISTORS				
60	METAL FILM 1/8W 1% 10Ω	CORNING	16299	RN55D	8
61	METAL FILM 1/4W 1% 49.9Ω	CORNING	16299	RN60D	3
62	METAL FILM 1/8W 1% 100Ω	CORNING	16299	RN55D	3
63	METAL FILM 1/8W 1% 121Ω	CORNING	16299	RN55D	1
64	METAL FILM 1/8W 1% 124Ω	CORNING	16299	RN55D	1
65	METAL FILM 1/8W 1% 200Ω	CORNING	16299	RN55D	1
66	METAL FILM 1/8W 1% 301Ω	CORNING	16299	RN55D (-79)	2
67	METAL FILM 1/8W 1% 316Ω	CORNING	16299	RN55D	3
68	METAL FILM 1/8W 1% 499Ω	CORNING	16299	RN55D	2
69	METAL FILM 1/8W 1% 604Ω	CORNING	16299	RN55D (-80)	2
70	METAL FILM 1/8W 1% 750Ω	CORNING	16299	RN55D	1
71	METAL FILM 1/8W 1% 301Ω	CORNING	16299	RN55D (-85)	1
72	METAL FILM 1/8W 1% 604Ω	CORNING	16299	RN55D (-86)	1
73	METAL FILM 1/8W 1% 1.00K	CORNING	16299	RN55D	4
74	METAL FILM 1/8W 1% 1.21K	CORNING	16299	RN55D	1
75	METAL FILM 1/8W 1% 1.50K	CORNING	16299	RN55D	6
76					
77	METAL FILM 1/8W 1% 2.00K	CORNING	16299	RN55D	2
78	METAL FILM 1/8W 1% 2.49K	CORNING	16299	RN55D	2
79	METAL FILM 1/8W 1% 3.32K	CORNING	16299	RN55D	6
80					
81	METAL FILM 1/8W 1% 4.02K	CORNING	16299	RN55D	1
82	METAL FILM 1/8W 1% 4.32K	CORNING	16299	RN55D	4
83	METAL FILM 1/8W 1% 4.99K	CORNING	16299	RN55D	2
84	METAL FILM 1/8W 1% 6.98K	CORNING	16299	RN55D	1
85	METAL FILM 1/8W 1% 8.87K	CORNING	16299	RN55D	1

NOTE UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND BREAK SHARP EDGES
MAT'L DIA.
FINISH WAVETEK PROCESS
DRAWN G. REDMAN DATE 7/12/74
PROJENGR
RELEASE APPROV
TOLERANCE UNLESS OTHERWISE SPECIFIED XXX ±.010 ANGLES ±1 XX ±.030
DO NOT SCALE DWG
SCALE

WAVETEK SAN DIEGO, CALIFORNIA

TITLE ASSEMBLY, MAIN BOARD (1A1) TRANSMITTER

B398-012

REV

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PARTS LIST					
LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
86	METAL FILM 1/8W 1% 9.53K	CORNING	16299	RN55D	1
87	METAL FILM 1/8W 1% 10.0K	CORNING	16299	RN55D	6
88	METAL FILM 1/8W 1% 12.1K	CORNING	16299	RN55D	1
89	METAL FILM 1/8W 1% 13.0K	CORNING	16299	RN55D	1
90	METAL FILM 1/8W 1% 21.5K	CORNING	16299	RN55D	1
91	METAL FILM 1/8W 1% 24.9K	CORNING	16299	RN55D	1
92	METAL FILM 1/8W 1% 30.1K	CORNING	16299	RN55D	2
93	METAL FILM 1/8W 1% 46.4K	CORNING	16299	RN55D	6
94	METAL FILM 1/8W 1% 49.9K	CORNING	16299	RN55D	2
95	METAL FILM 1/8W 1% 90.9K	CORNING	16299	RN55D	1
96	METAL FILM 1/8W 1% 124K	CORNING	16299	RN55D	1
97	METAL FILM 1/8W 1% 221K	CORNING	16299	RN55D	1
98	METAL FILM 1/8W 1% 237K	CORNING	16299	RN55D	1
99	METAL FILM 1/4W 1% 1M	CORNING	16299	RN60D	1
100	CARBON 1/2W 5% 10M	STACKPOLE	29604	RC20GF	1
101	METAL FILM 1/8W 1% 1.78K	CORNING	16299	RN55D	1
102	METAL FILM 1/8W 1% 27.4K	CORNING	16299	RN55D	1
103	RESISTOR MATCHED SETS 10.0K	CORNING	16299	RN55D (-64)	6
104	RESISTOR MATCHED SETS 15.8K	CORNING	16299	RN55D (-76)	2
105	RESISTOR MATCHED SETS 46.4K	CORNING	16299	RN55D (-77)	2
106	RESISTOR MATCHED SETS 110K	CORNING	16299	RN55D (-78)	2
107	METAL FILM 1/8W 100K	CORNING	16299	RN55D	4
108					
109	SWITCHES				
110	SWITCHES	WAVETEK	23338	B420-403	1
111	SWITCHES	WAVETEK	23338	B750-400	2
112	SWITCHES	WAVETEK	23338	B398-501	1
113	CONNECTOR 25 PIN	CANNON	71468	DBC25S	1
114					

PARTS LIST					
LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
115	MTG BLOCK	PANDUIT	06383	TM-256C	2
116	TRANSISTOR PAD	MILTON ROSS	07047	10123N	4
117	SWAGE STANDOFF	AMOTOM	06540	9531B-B-0440-3A	2
118	AMP PINS	AMP	00779	61182-2	25
119					
120	TIE STRAP	PANDUIT	06383	SST-1.5M	2
121					
122	CIRCUIT BOARD	WAVETEK	23338	398-105A	1

	12						
	8						
	16						
	3						
	12						
	8						
	16						
	9						
	9	R1	38			R51	67
	9	R2	38			R52	92
	11	R3	38			R53	62
	3	R4	38			R54	73
	11	R5	38			R55	79
	4	R6	40			R56	93
	4	R7	37			R57	73
	13	R8	39			R58	104
	13	R9	40			R59	67
	11	R10	36			R60	105
	4	R11	41			R61	103
	4	R12	40			R62	105
	11	R13	37			R63	103
	2	R14	37			R64	65
	4	R15	79			R65	106
	7	R16	79			R66	104
	16	R17	81			R67	103
	16	R18	75			R68	106
	4	R19	83			R69	64
	14	R20	87			R70	105
	16	R21	73			R71	61
	16	R22	75			R72	93
		R23	73			R73	83
		R24	103			R74	82
CR1	23	R25	82			R75	9
CR2	24	R26	75			R76	75
CR3	24	R27	97			R77	75
CR4	25	R28	87			R78	60
CR5	25	R29	93			R79	88
CR6	24	R30	104			R80	78
CR7	24	R31	93			R81	87
CR8	24	R32	93			R82	89
CR9	24	R33	100			R83	75
CR10	24	R34	82			R84	95
		R35	99			R85	62
IC1	29	R36	93			R86	79
IC2	30	R37	90			R87	79
IC3	29	R38	84			R88	60
IC4	30	R39	64			R89	60
IC5	29	R40	87			R90	68
IC6	31	R41	74			R91	61
IC7	29	R42	64			R92	61
IC8	31	R43	1			R93	68
		R44	1			R94	70

LINE ITEM REFERENCE LIST

		REF DES	P/N LINE			
R95	97					
R96	102					
R97	91					
R98	94					
R99	96					
R100	96					
R101	69					
R102	69					
R103	66					
R104	101					
R105	71					
R106	72					
R107	78					
R108	60					
R109	60					
R110	60					
R111	60					
R112	60					
R113	107					
R114	38					
R115	87					
R116	40					
R117	107					
R118	79					
Sw1	111					
SW2	111					
Sw3	111					
SW4	111					
SW5	110					
SW6	110					
SW7	110					
SW8	110					
SW9	110					
Sw10	109					
Sw11	109					
Sw12	110					
Sw13	110					
Sw14	112					
T1	55					

NOTE UNLESS OTHERWISE SPECIFIED

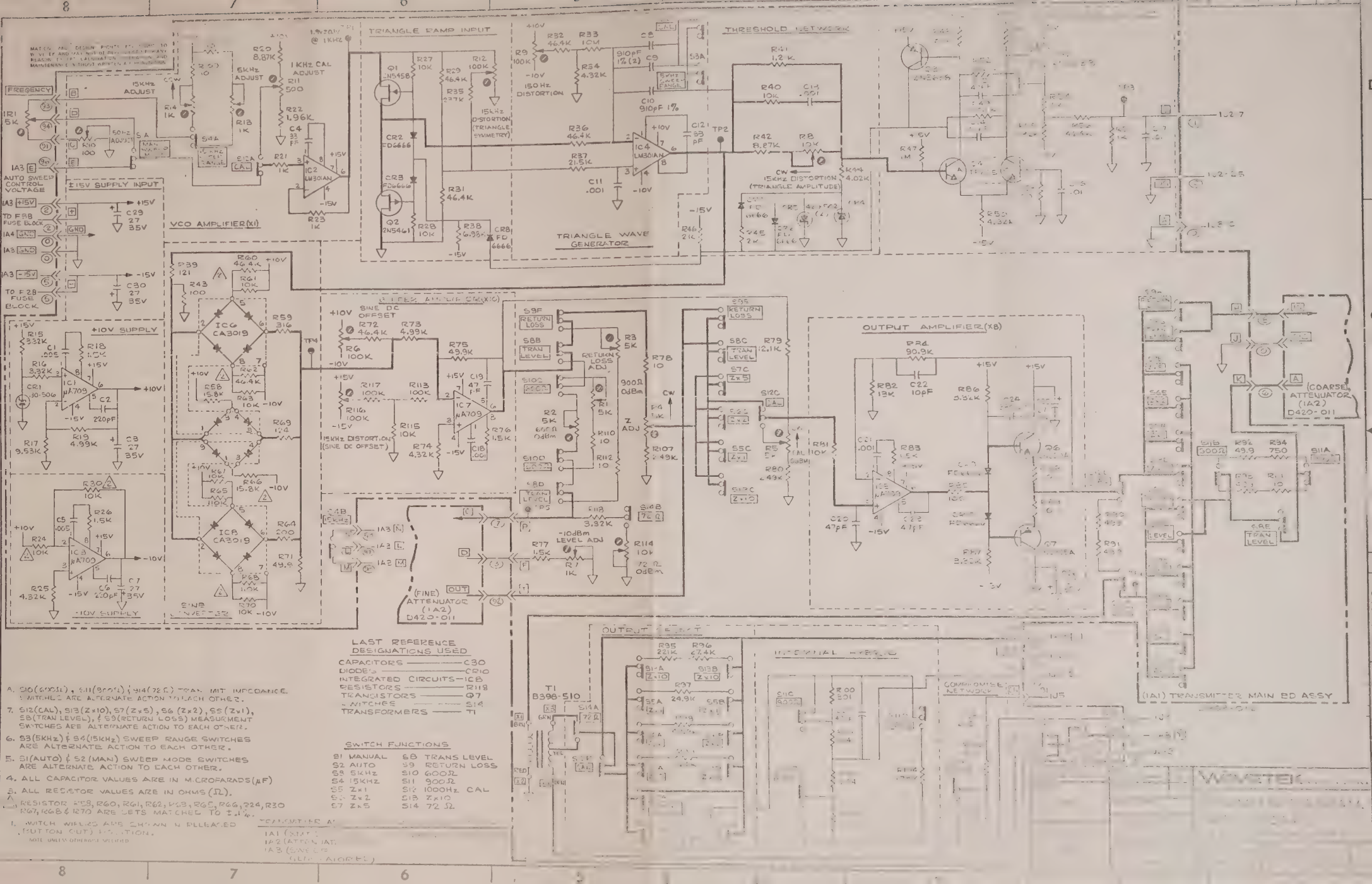
REMOVE ALL BURRS AND BREAK SHARP EDGES
MATERIAL
FINISH WAVETEK PROCESS
DRAWN
RELEASE APPROV
TOLERANCE UNLESS OTHERWISE SPECIFIED XXX .010 ANGLES ±1° XX .030

WAVETEK SAN DIEGO • CALIFORNIA

TITLE
ASSEMBLY, MAIN BOARD (IAI) TRANSMITTER

B398-012

REV



LAST REFERENCE DESIGNATIONS USED

CAPACITORS	C30
DIODES	CR10
INTEGRATED CIRCUITS	IC8
RESISTORS	R118
TRANSISTORS	Q7
SWITCHES	S14
TRANSFORMERS	T1

SWITCH FUNCTIONS

S1 MANUAL	S8 TRANS LEVEL
S2 AUTO	S9 RETURN LOSS
S3 5KHz	S10 600Ω
S4 15KHz	S11 900Ω
S5 Zx1	S12 1000Hz CAL
S6 Zx2	S13 Zx10
S7 Zx5	S14 72 Ω

A. S10(600Ω), S11(900Ω) & S14(72Ω) TRANSMIT IMPEDANCE SWITCHES ARE ALTERNATE ACTION TO EACH OTHER.

7. S12(CAL), S13(Zx10), S7(Zx5), S6(Zx2), S5(Zx1), S8(TRAN LEVEL), & S9(RETURN LOSS) MEASUREMENT SWITCHES ARE ALTERNATE ACTION TO EACH OTHER.

6. S3(5KHz) & S4(15KHz) SWEEP RANGE SWITCHES ARE ALTERNATE ACTION TO EACH OTHER.

5. S1(AUTO) & S2(MAN) SWEEP MODE SWITCHES ARE ALTERNATE ACTION TO EACH OTHER.

4. ALL CAPACITOR VALUES ARE IN MICROFARADS (μF).

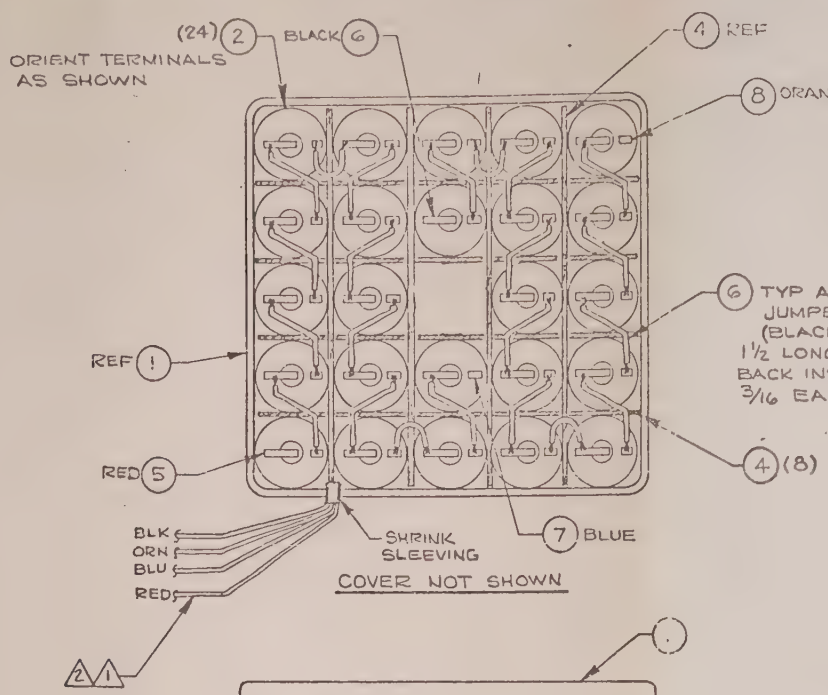
3. ALL RESISTOR VALUES ARE IN OHMS (Ω).

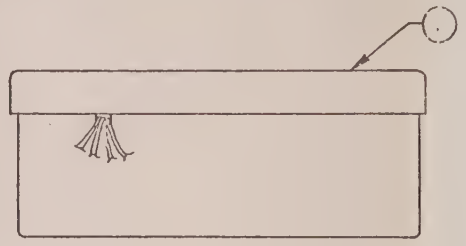
^ RESISTOR #'S R58, R60, R61, R62, R63, R65, R66, R224, R30 R67, R68 & R70 ARE SETS MATCHED TO ±1%.

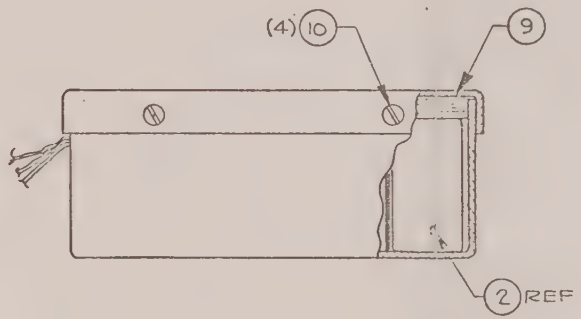
1. SWITCH WAFERS ARE SHOWN AS VIEWED FROM REAR OF SWITCH (BUTTON CUT) POSITION.

NOTE UNLESS OTHERWISE SPECIFIED

TRANSMITTER ASSY
1A1 (MAIN)
1A2 (ATTENUATOR)
1A3 (SINE DC OFFSET GEN. MODEL)







PARTS LIST

LINE NO.	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	BATTERY BOX	WAVETEK		B420-325	1
2	BATTERY	UNION CARBIDE		420-526	24
3					
4	SEPARATOR STRIP	WAVETEK		A420-352	8
5	WIRE, TEFLON 22AWG (RED)	ALPA		MIL-W-16878	A/R
6	(BLACK)				A/R
7	(BLUE)				A/R
8	(ORANGE)				A/R
9	FOAM	WAVETEK		A420-351	1
10	SCREW, SELF TAPPING FLAT HEAD (SLOTTED) #4-24 x 1/4 TYPE B(Z)	COM'L		—	4
11	AMP PIN (FEMALE)	AMP		60598-8	4

CAUTION

CHARGED BATTERIES, DO NOT SHORT CIRCUIT BATTERY TERMINALS

⚠2 AMP PINS (4) ON ENDS OF WIRE HARNESS MUST BE COMPLETLY COVERED WITH SHRINK SLEEVING, OR EQUIV, BEFORE HARNESS IS CONNECTED TO BATTERY PACK.

⚠1 C420-004 – INSTALL WIRE HARNESS FOR TRANSMITTER INSTALLATION.
C420-005 – INSTALL WIRE HARNESS FOR RECEIVER INSTALLATION.

NOTES:

REV	ECN	BY	DATE	APP
C	ECN 773	F F	11-5-73	
B	REVISED ASSY	B R	6-18-73	
A	REVISED ALOY	B R	5 8 73	

TOLERANCE UNLESS OTHERWISE SPEC
XXX ± .010
XX ± .030
ANGLES ± 0°30'

WAVETEK SAN DIEGO, CALIF

SCALE 1/1 | DATE 6-5-73 | APP

MATERIAL

TITLE
BATTERY PACK
A420-351-1

FINISH

SIZE | DWG NO | REV C

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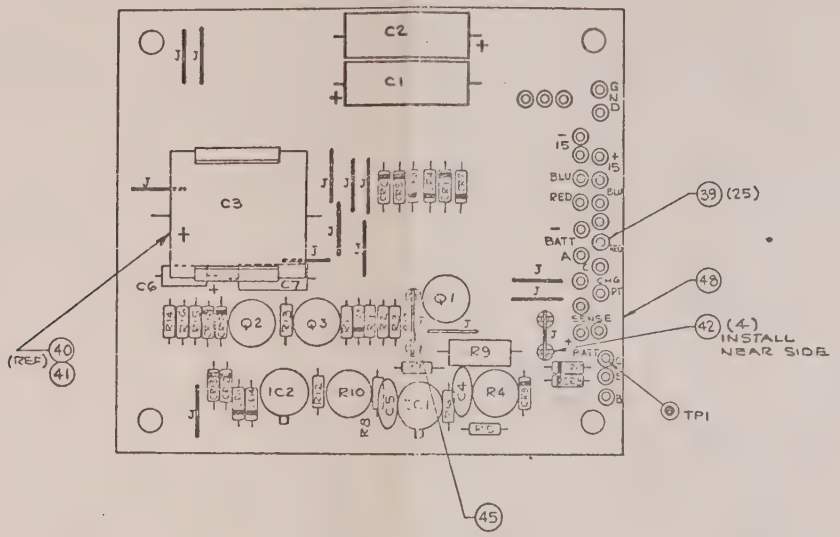
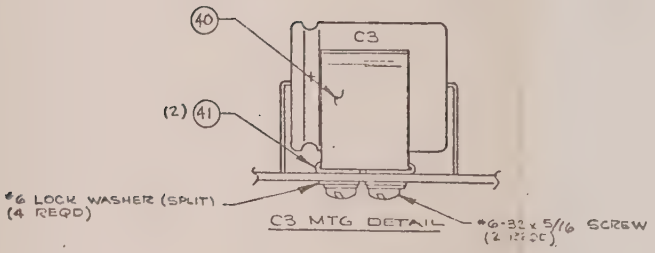
REV	ECN	BY	DATE	APP
C	773	BA	1/23/81	
D	ECN 911	DN	6/24/81	
E	ECN 949	DN	8/31/81	
F	ECN 951	BA	9/4/81	





NOTE UNLESS OTHERWISE SPECIFIED

WAVETEK SAN DIEGO, CALIFORNIA

ASSEMBLY BATTERY CHARGER BD (1A4) TRANSMITTER

470 | 5470-010 | F

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REV	ECN	BY	DATE	APP

PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	CAPACITORS				
2	CERAMIC DISC 50V .005µF	CRL	71590	CK502	1
3	CERAMIC DISC 220PF	CRL	71590	DD221	1
4	TANTALUM .47µF	SPRAGUE	56289	150D474X9050B2	1
5	TANTALUM 10uF	SPRAGUE	56289	150D106X9020B2	1
6	ELECTROLYTIC 50V 50uF	SPRAGUE	56289	500D506G05DD7	2
7	ELECTROLYTIC 75V 250µF	SPRAGUE	56289	39D257G075JE4	1
8					
9					
10	DIODE 6.4V ZENER	DICKSON	12954	IN4581	1
11	DIODE 100V G.P. SILICON	MOTOROLA	04713	IN4002	7
12	DIODE 100V G.P. SILICON	FAIRCHILD	33888	FD6666	8
13					
14					
15					
16	INTEGRATED CIRCUITS µA709	FAIRCHILD	33888	µA709 C (-13) (-14)	1
17	INTEGRATED CIRCUITS µA709	FAIRCHILD	33888	µA709C (-14)	1
18					
19					
20	TRANSISTOR 2N3642	FAIRCHILD	33888	2N3642	1
21	TRANSISTOR 2N3643	FAIRCHILD	33888	2N3643	2
22					
23	RESISTOR CARBON 1W 5% 470Ω	STACKPOLE	29604	RC32GF471J	1
24	METAL FILM 1/8W 1% 1K	CORNING	16299	RN55D	4
25	METAL FILM 1/8W, 1% 1.5K	CORNING	16299	RN55D	1
26	METAL FILM 1/8W 1% 10K	CORNING	16299	RN55D	2
27	METAL FILM 1/8W 1% 21.5K	CORNING	16299	RN55D	1
28	METAL FILM 1/8W 1% 49.9K	CORNING	16299	RN55D	2
29	METAL FILM 1/8W 1% 69.8K	CORNING	16299	RN55D	1
30	METAL FILM 1/8W 1% 100K	CORNING	16299	RN55D	1

PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
31	METAL FILM 1/8W 1% 301K	CORNING	16299	RN55D	1
32	POTENTIOMETER 100Ω	BECKMAN	80740	91AR100Ω	1
33	POTENTIOMETER 10K	BECKMAN	80740	91AR10K	1
34					
35					
36					
37					
38					
39	AMP PINS	AMP	00779	61182-2	25
40	CLAMP	SEASTROM	86928	4511-100-68-2C	1
41	TINNERMAN CLIPS	TINNERMAN	78553	C880-632	2
42	TERMINALS	USECO	88245	20008-1	4
43					
44	TRANSISTOR PAD	MILTON ROSS	07047	10123N	3
45	RESISTANCE WIRE 3/4"	WILBER DRIVER	72005	#30 AWG (30PER FOOT)	1
46					
47					
48	CIRCUIT BOARD	WAVETEK	25338	420-1108	1
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					

LINE ITEM REFERENCE LIST

REF DES	P/L LINE	REF DES	P/L LINE	REF DES	P/L LINE
C1	6	R1	27		
C2	6	R2	26		
C3	7	R3	28		
C4	2	R4	32		
C5	3	R5	29		
C6	4	R6	25		
C7	5	R7	29		
		R8	24		
		R9	25		
CR1	11	R10	33		
CR2	11	R11	23		
CR3	11	R12	22		
CR4	11	R13	33		
CR5	11	R14	24		
CR6	11	R15	26		
CR7	10	R16	31		
CR8	12	R17	45		
CR9	12				
CR10	11				
CR11	12				
CR12	12				
CR13	12				
CR14	12				
CR15	12				
CR16	12				
IC1	17				
IC2	16				
Q1	20				
Q2	21				
Q3	21				

NOTE: UNLESS OTHERWISE SPECIFIED

WAVETEK SAN DIEGO, CALIFORNIA

TITLE: ASSEMBLY BATTERY CHARGER BD (TRANSMITTER)

420-1108 F

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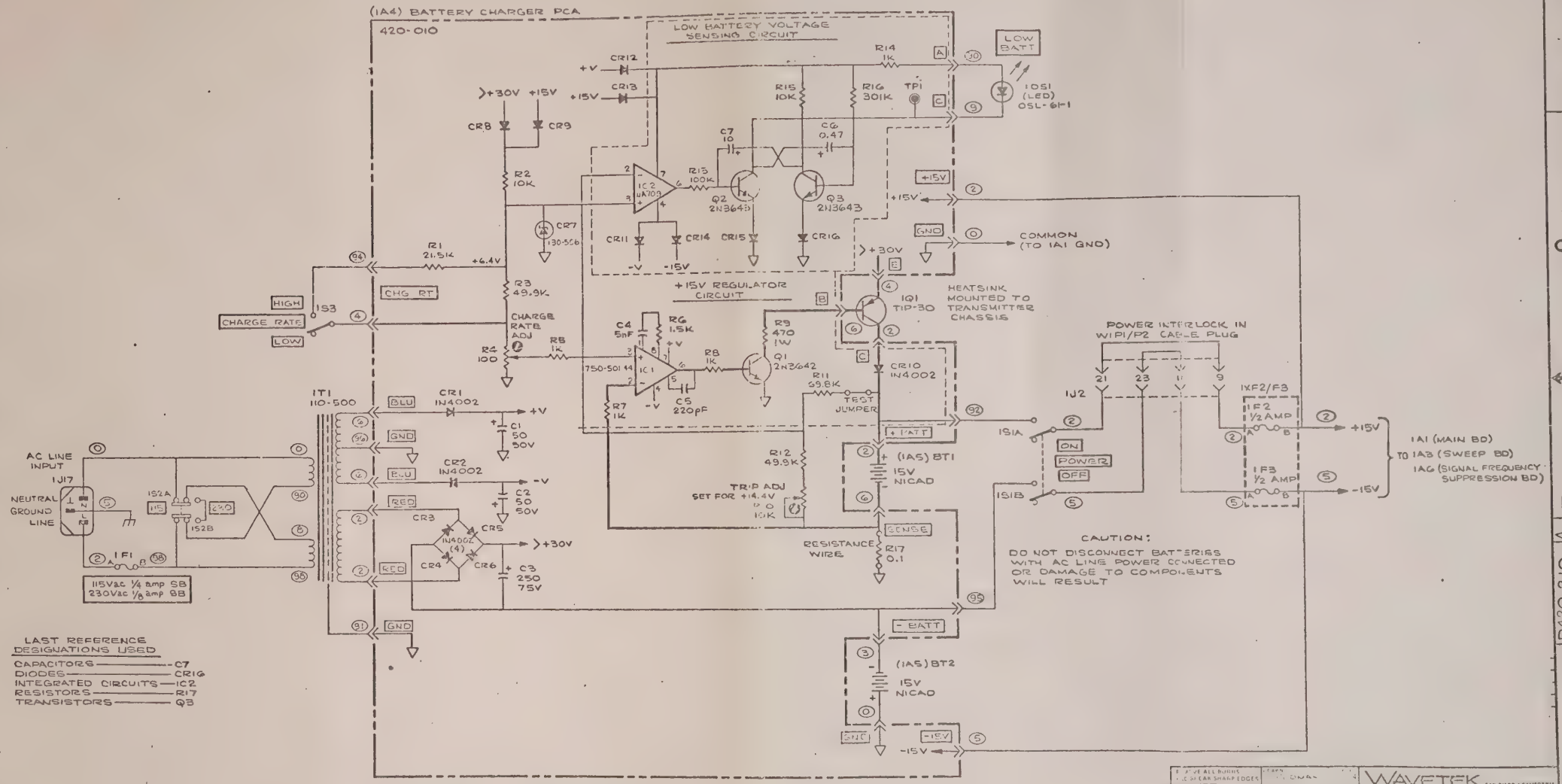

LAST REFERENCE DESIGNATIONS USED

CAPACITORS	C7
DIODES	CR16
INTEGRATED CIRCUITS	IC2
RESISTORS	R17
TRANSISTORS	Q3

3. ALL DIODES ARE FDG666.
2. ALL RESISTORS IN OHMS (Ω).
1. ALL CAPACITORS IN MICROFARADS (μF).

NOTE UNLESS OTHERWISE SPECIFIED

WAVETEK	SAN DIEGO, CALIFORNIA
TITLE	SCHEMATIC DIAGRAM, BATTERY CHARGER BD (1A4 TRANSMITTER)
DWG NO.	D420-210
REV	A
SHEET	1 OF 1

D420-210 A

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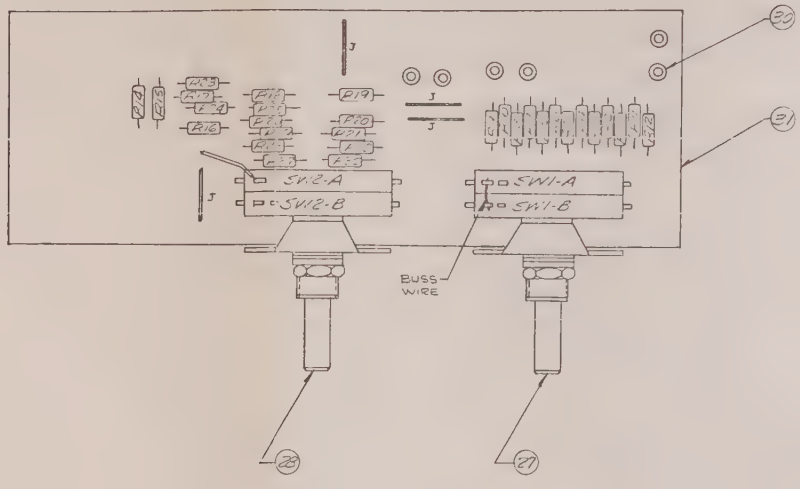

NOTE UNLESS OTHERWISE SPECIFIED

WAVETEK

ASSEMBLY ATTENUATOR

E110-0220

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REV	ECN	BY	DATE	APP

PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	RESISTORS				
2	METAL FILM, 1/8W, 1%, 100	CORNING	16299	RN55D	2
3	METAL FILM, 1/8W, 1%, 21.5Ω	CORNING	16299	RN55D	1
4	METAL FILM, 1/8W, 1%, 39.2Ω	CORNING	16299	RN55D	2
5	METAL FILM, 1/8W, 1%, 46.4Ω	CORNING	16299	RN55D	1
6	METAL FILM, 1/8W, 1%, 54.9Ω	CORNING	16299	RN55D	1
7	METAL FILM, 1/8W, 1%, 90.9Ω	CORNING	16299	RN55D	1
8	METAL FILM, 1/8W, 1%, 124Ω	CORNING	16299	RN55D	1
9	METAL FILM, 1/8W, 1%, 150Ω	CORNING	16299	RN55D	1
10	METAL FILM, 1/8W, 1%, 182Ω	CORNING	16299	RN55D	1
11	METAL FILM, 1/8W, 1%, 200Ω	CORNING	16299	RN55D	2
12	METAL FILM, 1/8W, 1%, 249Ω	CORNING	16299	RN55D	1
13	METAL FILM, 1/8W, 1%, 274Ω	CORNING	16299	RN55D	2
14	METAL FILM, 1/8W, 1%, 301Ω	CORNING	16299	RN55D	3
15	METAL FILM, 1/8W, 1%, 316Ω	CORNING	16299	RN55D	1
16	METAL FILM, 1/8W, 1%, 332Ω	CORNING	16299	RN55D	2
17	METAL FILM, 1/8W, 1%, 464Ω	CORNING	16299	RN55D	1
18	METAL FILM, 1/8W, 1%, 499Ω	CORNING	16299	RN55D	1
19	METAL FILM, 1/8W, 1%, 511Ω	CORNING	16299	RN55D	1
20	METAL FILM, 1/8W, 1%, 523Ω	CORNING	16299	RN55D	1
21	METAL FILM, 1/8W, 1%, 909Ω	CORNING	16299	RN55D	1
22	METAL FILM, 1/8W, 1%, 3.01K	CORNING	16299	RN55D	1
23	METAL FILM, 1/8W, 1%, 4.99K	CORNING	16299	RN55D	1
24	METAL FILM, 1/8W, 1%, 9.53K	CORNING	16299	RN55D	1
25					
26					
27	SWITCH ASSEMBLY	WAVETEK	23338	AA20-406	1

PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
28	SWITCH ASSEMBLY	WAVETEK	23338	AA20-407	1
29					
30	AMP PINS	AMP	00779	61382-8	6
31	CIRCUIT BOARD	WAVETEK	23338	420-111E	1
32					
33					
34					
35					
36					
37					
38					
39					
40					

LINE ITEM REFERENCE LIST

REF DES	P/L LINE	REF DES	P/L LINE	REF DES	P/L LINE
R1	24	R21	18		
R2	10	R22	11		
R3	22	R23	13		
R4	4	R24	16		
R5	21	R25	7		
R6	6	R26	14		
R7	13	R27	6		
R8	1	R28	14		
R9	9	R29	5		
R10	8	R30	12		
R11	23				
R12	3				
R13	2				
R14	17				
R15	15	SW1	27		
R16	19	SW1	29		
R17	11				
R18	16				
R19	26				
R20	20				

NOTE UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND SHARP EDGES	DRAWN M. LOCHICAS DATE	WAVETEK SAN DIEGO, CALIFORNIA	
MATERIAL	APPROVED DATE	TITLE ASSEMBLY ATTENUATOR (TRANSMITTER)	
FINISH MFG'S STANDARD PROCESS	TOLERANCES UNLESS OTHERWISE SPECIFIED .XXX ±.010 .XX ±.02 ANGLES ±1°		
	DO NOT SCALE DRAWING	MODEL NO 420	DWG NO B420-011 REV F
	SCALE —	SIZE A 23338	SHEET 2 OF 2

B420-011 F

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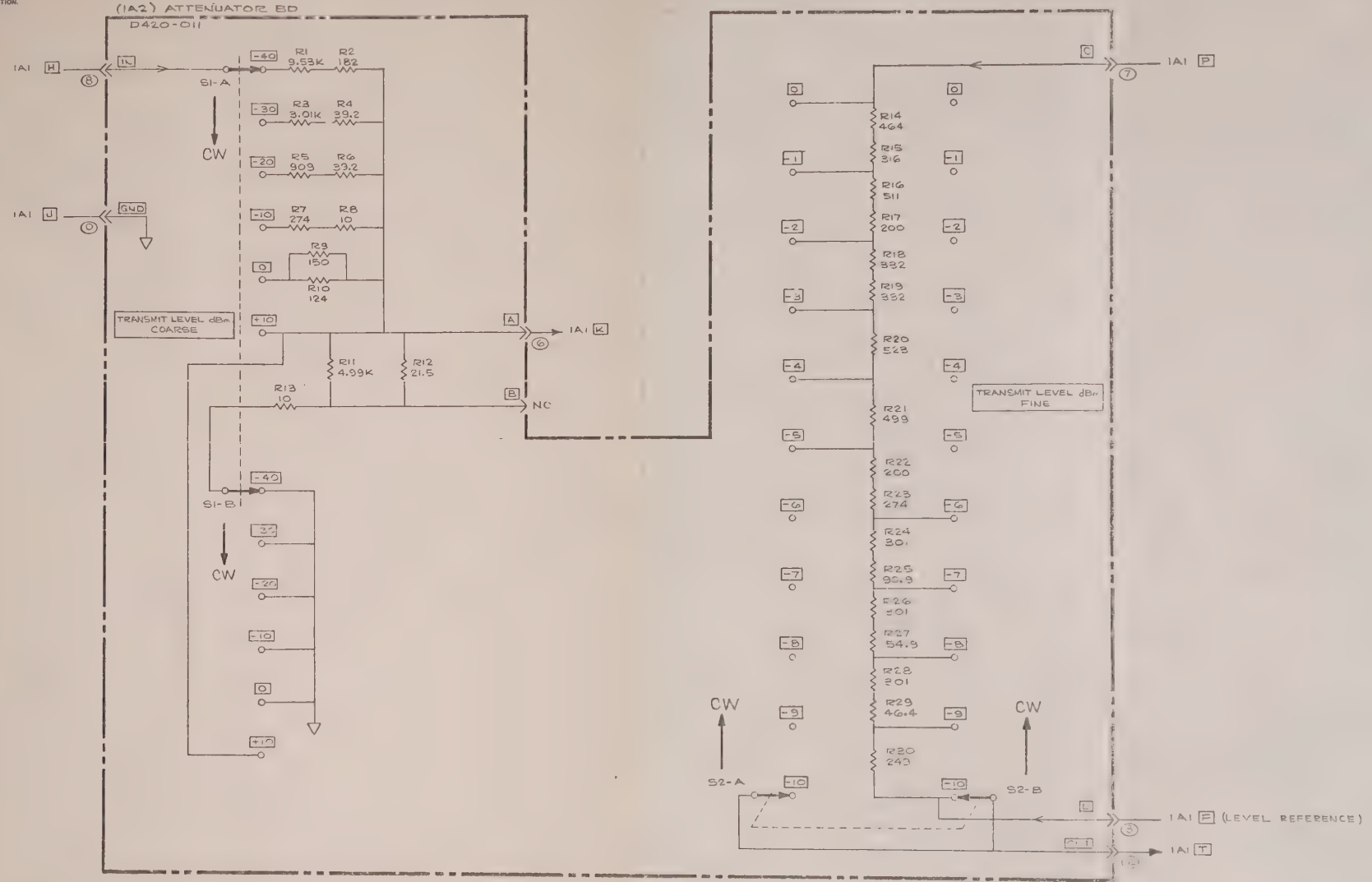

LAST REFERENCE DESIGNATIONS USED

RESISTORS —— R30

SWITCHES —— S2

2. ROTARY SWITCHES (S1 & S2) ARE SHOWN FULLY CCW AS VIEWED FROM KNOB END OF SHAFT.

1. ALL RESISTOR VALUES ARE IN OHMS (Ω).

NOTE: UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND BREAK SHARP EDGES

MATERIAL

FINISH

WAVETEK PROPRIETARY

WAVETEK

SCHEMATIC DIAGRAM, ATTENUATOR BD

1A1 TRANSMITTER

D420-211

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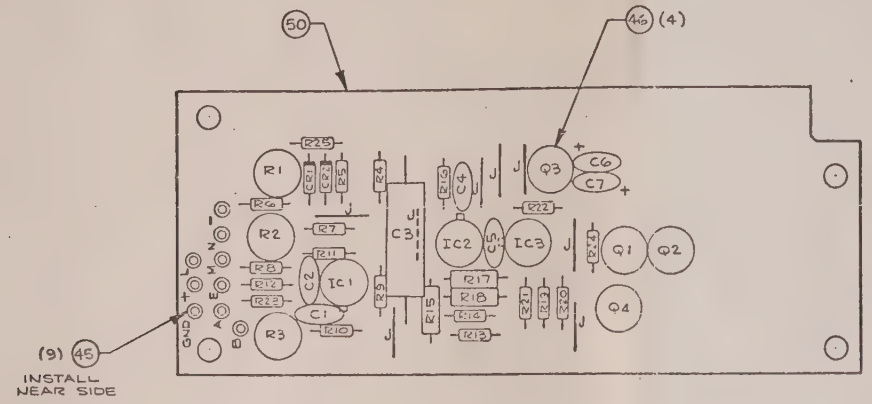
REV	L.N.	BY	DATE	APP
E	772 172			
F	995	DB	4-24	



NOTE UNLESS OTHERWISE SPECIFIED

WAVETEK SAN DIEGO, CALIFORNIA

ASSEMBLY
SWEEP GENERATOR
(TRANSMITTER)

420 | 1420-213 | 1

23318

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION AND DESIGN RIGHTS BELONGING TO WAVETEK AND MAY NOT BE REPRODUCED FOR ANY MAINTENANCE WITHOUT WRITTEN AUTHORIZATION

PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	CAPACITORS				
2	CERAMIC DISC 220PF	CRL	71590	OD221	2
3	CERAMIC DISC .005μF	CRL	71590	OD502	2
4					
5					
6	MYLAR 100V 1μF	ELECTROCUBE	14752	210B1C105F	1
7	TANTALUM 35V 33μF	SPRAGUE	56289	1OGD336X9035TE4	2
8					
9					
10	DIODES				
11	DIODE 6.4V ZENER	DICKSON	12954	IN4581	2
12					
13	INTEGRATED CIRCUITS				
14	INTEGRATED CIRCUITS μA790C	FAIRCHILD	33888	μA709C (-13)	2
15	INTEGRATED CIRCUITS μA709C	FAIRCHILD	33888	μA709C (-44)	1
16					
17	POTENTIOMETERS				
18	POTENTIOMETERS 5K	BECKMAN	80740	91AR5K	1
19	POTENTIOMETERS 100K	BECKMAN	80740	91AR100K	2
20					
21					
22	RESISTORS				
23	METAL FILM 1/8W 1% 100 Ω	CORNING	16299	RN55D	2
24	METAL FILM 1/8W 1% 1.5K	CORNING	16299	RN55D	2
25	METAL FILM 1/8W 1% 3.32K	CORNING	16299	RN55D	2
26	METAL FILM 1/8W 1% 4.32K	CORNING	16299	RN55D	1
27	METAL FILM 1/8W 1% 4.99K	CORNING	16299	RN55D	1
28	METAL FILM 1/8W 1% 6.19K	CORNING	16299	RN55D	1
29	METAL FILM 1/8W 1% 10K	CORNING	16299	RN55D	6

PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
30	METAL FILM 1/8W 1% 21.5K	CORNING	16299	RN55D	1
31	METAL FILM 1/8W 1% 30.1K	CORNING	16299	RN55D	1
32	METAL FILM 1/8W 1% 237K	CORNING	16299	RN55D	2
33					
34					
35	METAL FILM 1/4W 1% 49.9Ω	CORNING	16299	RN60D	1
36	METAL FILM 1/4W 1% 499K	CORNING	16299	RN60D	2
37					
38					
39	TRANSISTORS				
40	TRANSISTORS 2N3638	FAIRCHILD	33888	2N3638	2
41	TRANSISTORS 2N3642	FAIRCHILD	33888	2N3642	2
42					
43					
44					
45	AMP PINS	AMP	00779	61182-1	9
46	TRANSIPADS	MILTON ROSS	07047	10123N	4
47					
48					
49					
50	CIRCUIT BOARD	WAVETEK	23338	420-113-F	1

LINE ITEM REFERENCE LIST

REF DES	P/L LINE
C1	3
C2	2
C3	6
C4	3
C5	2
C6	7
C7	7
CR1	11
CR2	11
IC1	15
IC2	14
IC3	14
Q1	40
Q2	40
Q3	41
Q4	41

REF DES	P/L LINE
R1	19
R2	19
R3	18
R4	25
R5	25
R6	32
R7	31
R8	32
R9	26
R10	24
R11	30
R12	28
R13	25
R14	29
R15	36
R16	24
R17	35
R18	35
R19	29
R20	29
R21	27
R22	29
R23	23
R24	29
R25	23

NOTE UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND BREAK SHARP EDGES	DRAWN B. REDMAN	DATE 6-[illegible]
MATERIAL	PROJ ENGR	
	RELEASE APPROV	
FINISH WAVETEK PROCESS	TOLERANCE UNLESS OTHERWISE SPECIFIED XXX ±.010 XX ±.030 ANGLES ±1°	
	DO NOT SCALE DWG	
	SIZE	

WAVETEK SAN DIEGO, CALIFORNIA

TITLE: ASSEMBLY SWEEP GENERATOR (TRANSMITTER)

MODEL NO [illegible] DWG NO [illegible] REV [illegible]

23338 NEXT [illegible]

B420-013 G

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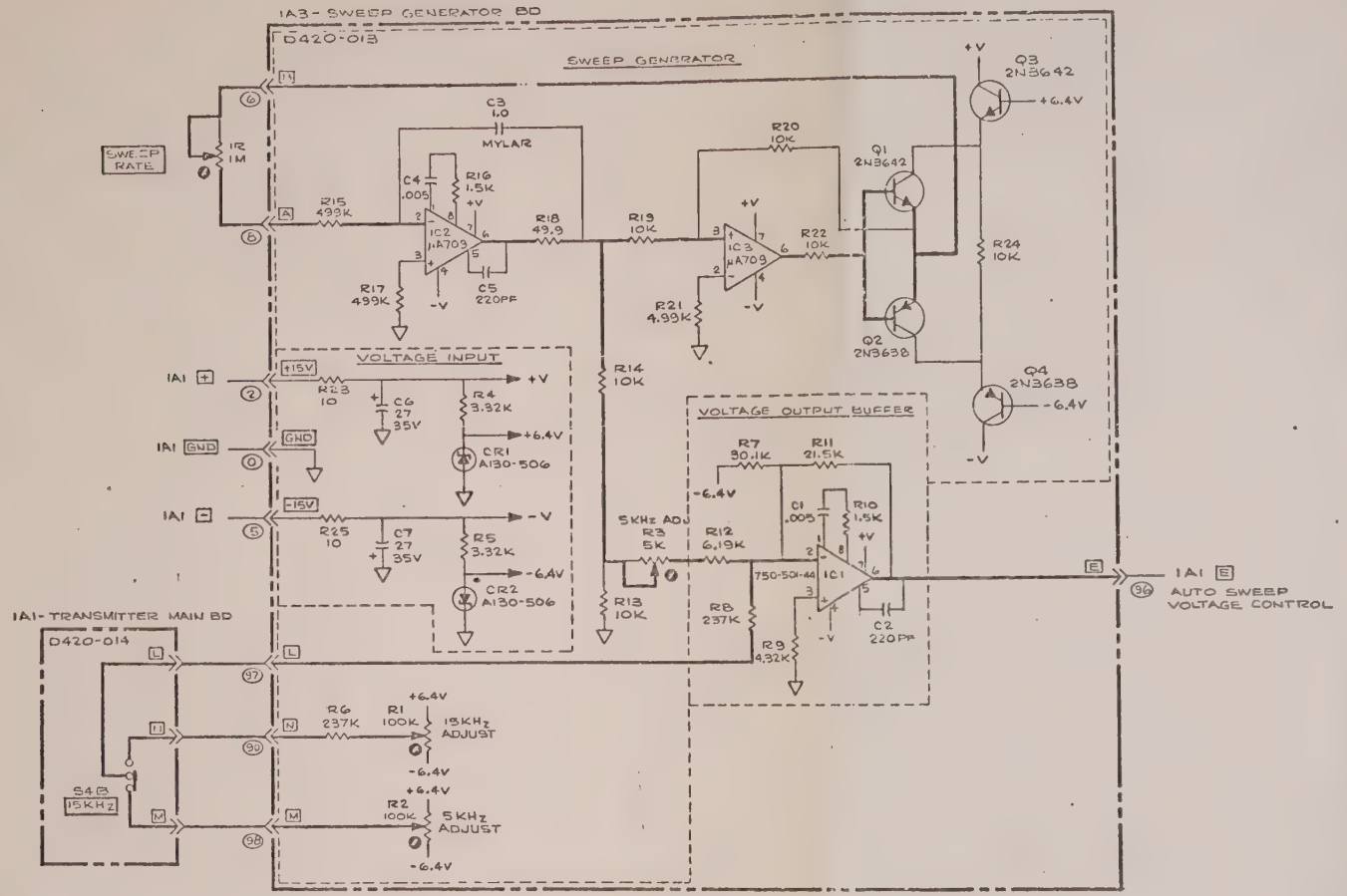

LAST REFERENCE DESIGNATIONS USED

CAPACITORS	C7
DIODES	CR2
INTEGRATED CIRCUITS	IC3
RESISTORS	R25
TRANSISTORS	Q4

3. SWITCH WIPERS ARE IN THE UNACTUATED (BUTTON OUT) POSITION.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS (μF).
1. ALL RESISTOR VALUES ARE IN OHMS (Ω).

NOTE UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND SHARP EDGES	DRAWN D. NEELMAN	DATE	WAVETEK SAN DIEGO, CALIFORNIA
MATERIAL #	RELEASE APPR		TITLE SCHEMATIC DIAGRAM, SWEEP GENERATOR BD (TRANSMITTER 1A3)
FINISH PROCESS #	TOLERANCES UNLESS OTHERWISE SPECIFIED .XX ±.01 .XXX ±.005 ANGLES ±1°		DWG NO 420 D420-213 REV A
	SCALE		SHEET 1 OF 1

8 7 6 5 4 3 2 1
D C B A
D420-213 A

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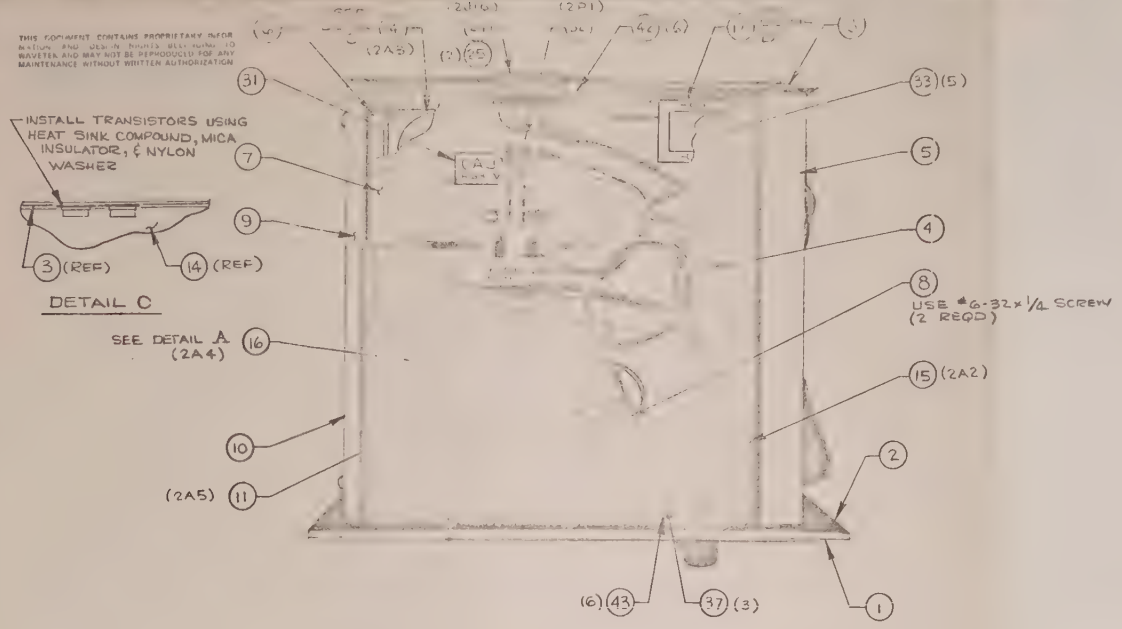
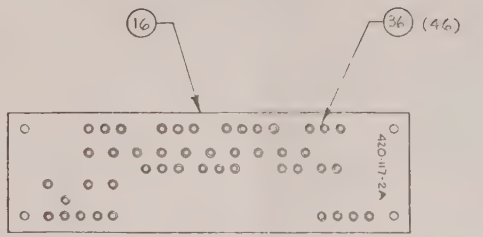
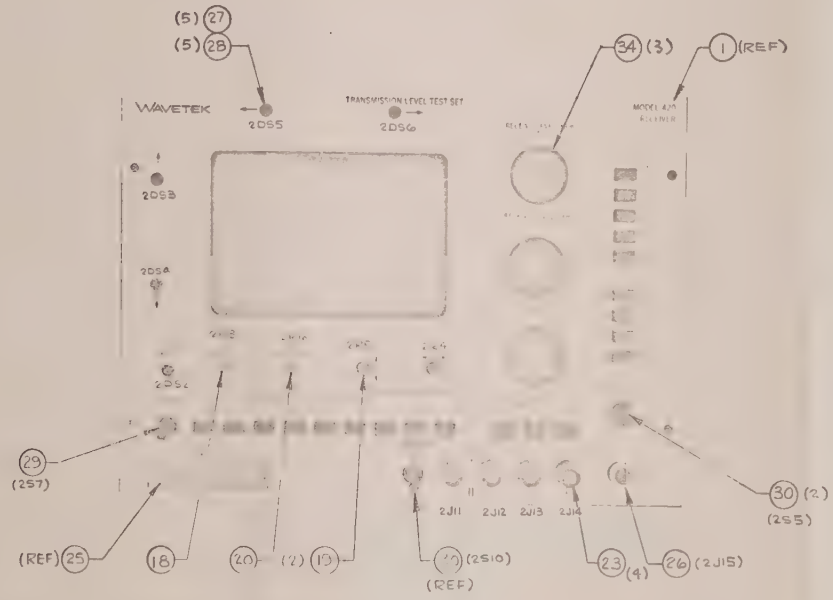
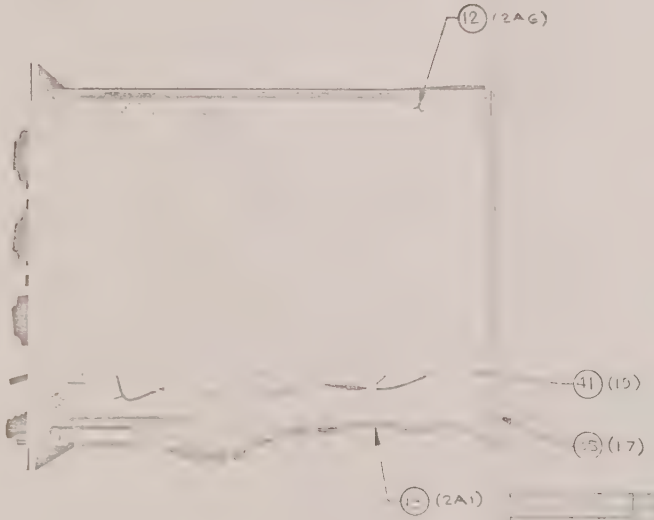


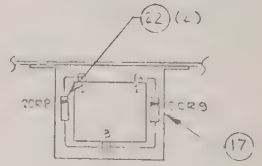
DETAIL C



DETAIL A
(2A4)







DETAIL B
SCALE: 1/1

1. ALL LOCK WASHERS MUST BE SPRING (SPLIP) LOCK TYPE.

WAVETEK

ASSEMBLY, RECEIVER

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PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	FRONT PANEL	WAVETEK	23338	C420-355	1
2	SUB PANEL	WAVETEK	23338	C420-303	1
3	REAR PANEL	WAVETEK	23338	C420-326	1
4	CHASSIS, HORIZ	WAVETEK	23338	D420-327	1
5	CHASSIS, VERT	WAVETEK	23338	C420-328	1
6	ENCLOSURE, H.V.	WAVETEK	23338	C420-329	1
7	COVER, ENCLOSURE	WAVETEK	23338	B420-330	1
8	BRACKET, POT MTG	WAVETEK	23338	C420-331	1
9	SUPPORT BAR	WAVETEK	23338	B420-332	1
10	SIDE PLATE	WAVETEK	23338	C420-344	1
11	CRT ASSEMBLY	WAVETEK	23338	D420-042	1
12	NOISE BOARD	WAVETEK	23338	D420-015	1
13	MAIN BOARD	WAVETEK	23338	D420-016	1
14	HIGH VOLTAGE BD	WAVETEK	23338	D420-012	1
15	ATTENUATOR BD	WAVETEK	23338	D420-020	1
16	INTERFACE BOARD	WAVETEK	23338	420-117A	1
17	HOLDING COIL	WAVETEK	23338	B420-525	1
18	POTENTIOMETER 100Ω	WAVETEK	23338	A420-522	1
19	POTENTIOMETER 10K	WAVETEK	23338	A420-523	2
20	POTENTIOMETER 100K	WAVETEK	23338	A420-524	1
21					
22	DIODE, ZENER	I.R.	81483	IN4744	2
23	BINDING POST	SUPERIOR	58474	DF21BC	4
24	CONNECTOR	CANNON	31746	DBC-25P	1
25	SPRING LATCH ASSY	CANNON	31746	D110277	2
26	PHONE JACK	SWITCH CRAFT	82389	MT-332B	1
27	LED	OPCOA		OSL-6L-1	5
28	LED MTG KIT	OPCOA		OC1	5
29	SWITCH DPDT	C & K	09353	7201-PDCN	1

PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
30	SWITCH SPDT	C & K	09353	7101-PDCN	2
31	LABEL, CAUTION	BRADY	85480	8513472-1	1
32	TUBE SOCKET (7 PIN)	INTERNATIONAL IMPORTS		S7-502B	1
33	GROMMET	H.H. SMITH	83330	2175	5
34	KNOB, SKIRTED BAR	RAYTHEON	94144	708-3-2G	3
35	SPEED NUT	TINNERMAN	78553	C880-632	17
36	AMP PIN (MALE)	AMP	00779	61182-2	46
37	PRESS BOLT	ROSAN	83324	PB6-325M-10	3
38	STANDOFF	USECO	88245	1531 A ¼-11	7
39					
40					
41	SCREW, SELF LOCKING #6-32 X 5/16	LONG-LOK	16941	LP-35206-227	19
42	NUT, SELF LOCKING #4-40	SPS	56878	21-FA-440	6
43	NUT, SELF LOCKING #6-32	SPS	56878	21-FA-632	6

NOTE: UNLESS OTHERWISE SPECIFIED

WAVETEK

ASSEMBLY,

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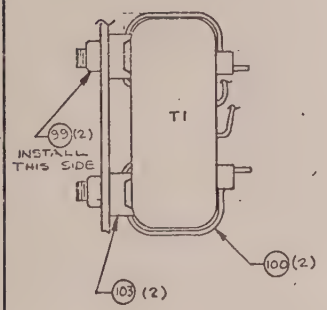
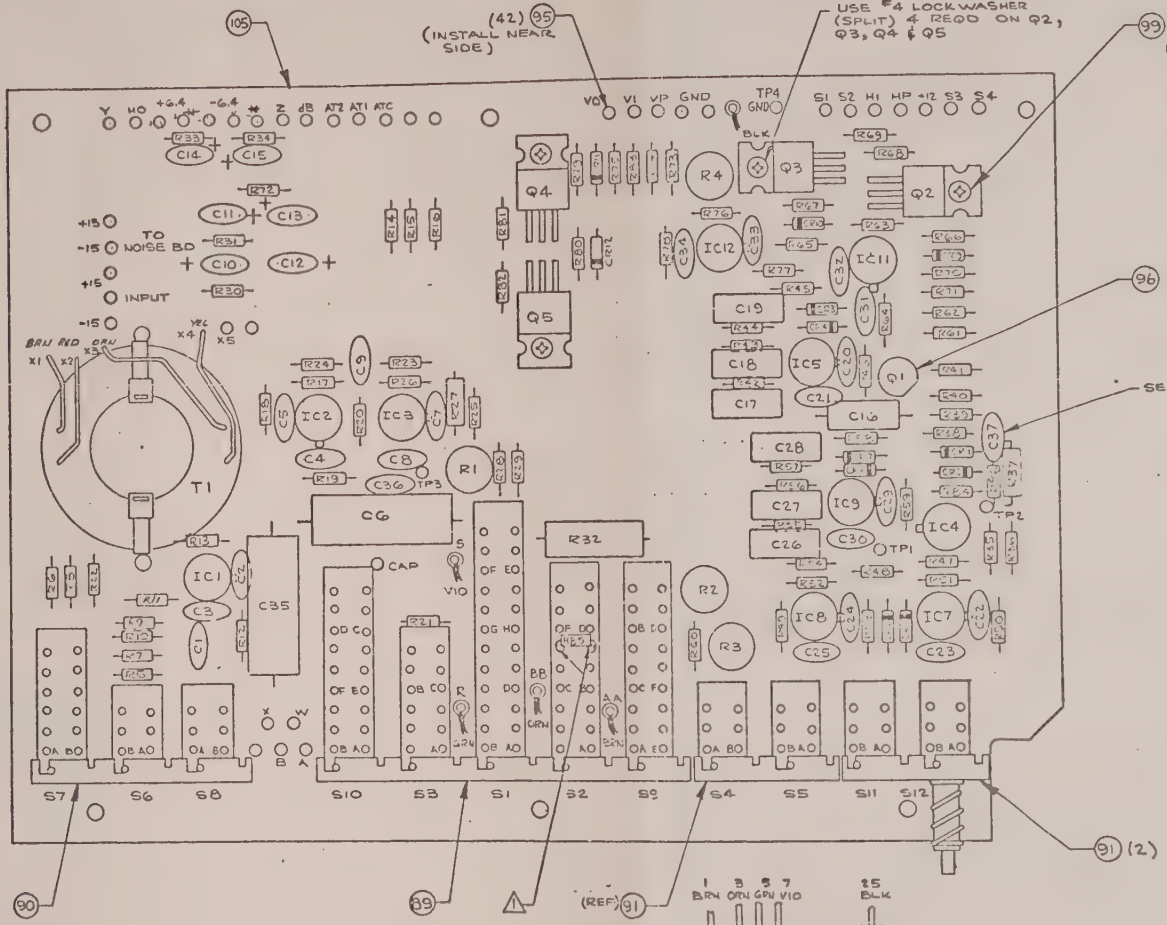
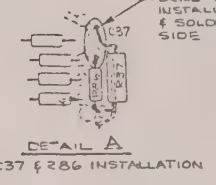
DES	ECN	BY	DATE	APP
D	709, 711			
E	732, 773			
F	994			
G	1118			







DETAIL A
C37 & R86 INSTALLATION

⚠ CUT ETCH ON BOARD BETWEEN THESE SWITCH PINS (S2)

NOTE UNLESS OTHERWISE SPECIFIED

WAVETEK SAN DIEGO, CA

ASSEMBLY
MAIN BOARD
(REVISION)

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REV	ECN	BY	DATE	APP

PARTS LIST

ITEM NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	CAPACITORS				
2	CERAMIC DISC, 22PF	CRL	71590	DD220	1
3	CERAMIC DISC, 47PF	CRL	71590	DD470	7
4	CERAMIC DISC, 100PF	CRL	71590	DD101	1
5	CERAMIC DISC, 220PF	CRL	71590	DD221	4
6					
7					
8	CERAMIC DISC, 1000V, .001UF	CRL	71590	DD102	5
9	CERAMIC DISC, 50V, .005UF	CRL	71590	CK502	4
10	MYLAR, 100V, .01μF	IMB	27556	PA2B103F	1
11	MYLAR 100V .1μF	SPRAGUE	56289	225PW	6
12					
13	MYLAR 200V, 10% 2μF	AMERICAN RADIONICS	07994	WVTK 2MFW-205K	1
14	TANTALUM 35V, 3μF	SPRAGUE	56289	196D336X9035TE4	6
15	MYLAR 200V 3% 2.15μF	AMERICAN RADIONICS	07994	WAVETEK 2MFW-205K (-81)	1
16					
17					
18					
19	DIODES				
20	FD6666	FAIRCHILD	33888	FD6666	8
21	6.4V ZENER	DICKSON	12954	2N4581(130-506)	2
22					
23	1N34	GENERAL ELECTRIC	09019	1N34	2
24					
25					
26					
27	INTEGRATED CIRCUITS				
28	μA709C	FAIRCHILD	33888	μA709C (-13 (-14)	10
29					
30					
31					
32	POTENTIOMETERS				
33					
34	1K	BECKMAN	80740	91AR1K	2
35	5K	BECKMAN	80740	91AR5K	1
36	10K	BECKMAN	80740	91AR10K	1
37					
38					
39	RESISTORS				
40	METAL FILM, 1/8W, 1%, 10Ω	CORNING	16299	RN55D	4
41	METAL FILM, 1/8W, 1%, 31.6Ω	CORNING	16299	RN55D	1
42	METAL FILM, 1/8W, 1%, 100Ω	CORNING	16299	RN55D	8
43	METAL FILM, 1/8W, 1%, 150Ω	CORNING	16299	RN55D	1
44	METAL FILM, 1/8W, 1%, 316Ω	CORNING	16299	RN55D	1
45	METAL FILM, 1/8W, 1%, 464Ω	CORNING	16299	RN55D	1
46	METAL FILM, 1/8W, 1%, 499Ω	CORNING	16299	RN55D	6
47	METAL FILM, 1/8W, 1%, 681Ω	CORNING	16299	RN55D	2
48	METAL FILM, 1/8W, 1%, 750Ω	CORNING	16299	RN55D	1
49	METAL FILM, 1/8W, 1%, 8.87K	CORNING	16299	RN55D	1
50	METAL FILM, 1/8W, 1%, 15.0K	CORNING	16299	RN55D	1
51	METAL FILM, 1/8W, 1%, 1.00K	CORNING	16299	RN55D	2
52	METAL FILM, 1/8W, 1%, 1.10K	CORNING	16299	RN55D	1
53	METAL FILM, 1/8W, 1%, 1.21K	CORNING	16299	RN55D	1
54	METAL FILM, 1/8W, 1%, 1.50K	CORNING	16299	RN55D	12
55	METAL FILM, 1/8W, 1%, 3.01K	CORNING	16299	RN55D	2
56	METAL FILM, 1/8W, 1%, 3.32K	CORNING	16299	RN55D	7
57	METAL FILM, 1/8W, 1%, 3.65K	CORNING	16299	RN55D	1

PARTS LIST

ITEM NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
58	METAL FILM, 1/8W, 1%, 4.99K	CORNING	16299	RN55D	2
59	METAL FILM, 1/8W, 1%, 10.0K	CORNING	16299	RN55D	8
60	METAL FILM, 1/8W, 1%, 12.1K	CORNING	16299	RN55D	1
61	METAL FILM, 1/8W, 1%, 21.5K	CORNING	16299	RN55D	1
62	METAL FILM, 1/8W, 1%, 19.1K	CORNING	16299	RN55D	2
63	METAL FILM, 1/8W, 1%, 30.1K	CORNING	16299	RN55D	1
64	METAL FILM, 1/8W, 1%, 49.9K	CORNING	16299	RN55D	6
65	METAL FILM, 1/8W, 1%, 63.4K	CORNING	16299	RN55D	1
66	METAL FILM, 1/8W, 1%, 124K	CORNING	16299	RN55D	2
67	METAL FILM, 1/8W, 1%, MATCHED 10.0K	CORNING	16299	RN55D (-64)	2
68	METAL FILM, 1/8W, 1%, 56.2K	CORNING	16299	RN55D	1
69					
70	METAL FILM 1/4W, 1% 1M	CORNING	16299	RN60D	2
71	CARBON, 2W, 5%, 91Ω	STACKPOLE	29604	RC42GF 910J	1
72					
73					
74					
75					
76					
77	TRANSISTORS				
78	2N3642	FAIRCHILD	33888	2N3642	1
79	TIP 29	T.I.	01295	TIP 29	2
80	TIP 30	T.I.	01295	TIP 30	2
81					
82					
83					
84	TRANSFORMER 61228	WAVETEK	23338	8420-509	1
85					
86					
87					
88	SWITCHES				
89	SWITCH ASSY	WAVETEK	23338	8420-402	1
90	SWITCH ASSY	WAVETEK	23338	8420-401	1
91	SWITCH ASSY	WAVETEK	23338	8750-400	2
92					
93					
94	AMP PINS (FEMALE)	AMP	00779	60598-8	5
95	AMP PINS (MALE)	AMP	00779	61182-2	49
96	TRANSISTOR PAD	MILTON ROSS	07047	10123N	1
97	CONNECTOR	CANNON	71468	DBC25S	1
98					
99	SNAGE STANDOFF	AMOTOM	06540	9531B-B-0440-3A	6
100	TIE STRAP	PANDUIT	06383	SST-1.5M	2
101					
102					
103	MTG BLOCK	PANDUIT	06383	TM-256C	2
104					
105	CIRCUIT BOARD	WAVETEK	23338	420-116C	1

LINE ITEM REFERENCE LIST

REF DES	P/L LINE
C1	1
C2	8
C3	5
C4	8
C5	3
C6	13
C7	8
C8	3
C9	2
C10	14
C11	14
C12	14
C13	14
C14	14
C15	14
C16	10
C17	11
C18	11
C19	11
C20	9
C21	5
C22	8
C23	3
C24	8
C25	3
C26	11
C27	11
C28	11
C29	9
C30	5
C31	9
C32	5
C33	9
C34	5
C35	15
C36	3
C37	4
CR1	21
CR2	21
CR3	20
CR4	20
CR5	23
CR6	23
CR7	20
CR8	20
CR9	20
CR10	20
CR11	20
CR12	20
IC1	28
IC2	28
IC3	28
IC4	28
IC5	28
IC6	NOT USED
IC7	28
IC8	28
IC9	28
IC10	NOT USED
IC11	28
IC12	28
Q1	78
Q2	79
Q3	80
Q4	79
Q5	80

REF DES	P/L LINE
R1	36
R2	34
R3	35
R4	34
R5	46
R6	48
R7	42
R8	43
R9	46
R10	42
R11	59
R12	54
R13	59
R14	45
R15	46
R16	41
R17	51
R18	52
R19	54
R20	59
R21	55
R22	55
R23	60
R24	59
R25	54
R26	65
R27	70
R28	62
R29	62
R30	42
R31	42
R32	71
R33	42
R34	42
R35	56
R36	56
R37	70
R38	47
R39	44
R40	58
R41	56
R42	64
R43	64
R44	64
R45	66
R46	54
R47	59
R48	67
R49	58
R50	54
R51	59
R52	67
R53	54
R54	59
R55	64
R56	64
R57	64
R58	66
R59	54
R60	57
R61	54
R62	63
R63	54
R64	54
R65	42
R66	56
R67	56
R68	40
R69	40
R70	61
R71	46
R72	46
R73	51
R74	49
R75	50
R76	54
R77	54
R78	42
R79	56
R80	40
R81	46
R82	40
R83	46
R84	47
R85	68
R86	59
SW1	89
SW2	89
SW3	89
SW4	91
SW5	91
SW6	90
SW7	90
SW8	90
SW9	89
SW10	89
SW11	91
SW12	91
T1	84

NOTE UNLESS OTHERWISE SPECIFIED

DRAWN	J. RAY	WAVETEK SAN DIEGO, CALIFORNIA	
ENGINEER		TITLE	ASSEMBLY MAIN BOARD (RECEIVING)
RELEASE APPROVAL			
DATE		SHEET NO.	DRAWING NO. 420165 REV

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T1 6128 (B420-509)

X-Y RECORDER OPTION

⚠ MATCHED PAIR REF WAVETEK 420-505-1
2. DIODES ARE FD6666.
1. SWITCH WIPERS ARE SHOWN IN ACTUATED (BUTTON DEPRESSED) POSITION.

NOTE UNLESS OTHERWISE SPECIFIED

LAST REF DES USED

C37	RB6
CR12	SW12
IC12	T1
Q5	

WAVETEK SAN DIEGO, CALIFORNIA

SCHEMATIC MAIN BD (RCVR)

D420-216 REV B SHEET 1 OF 1

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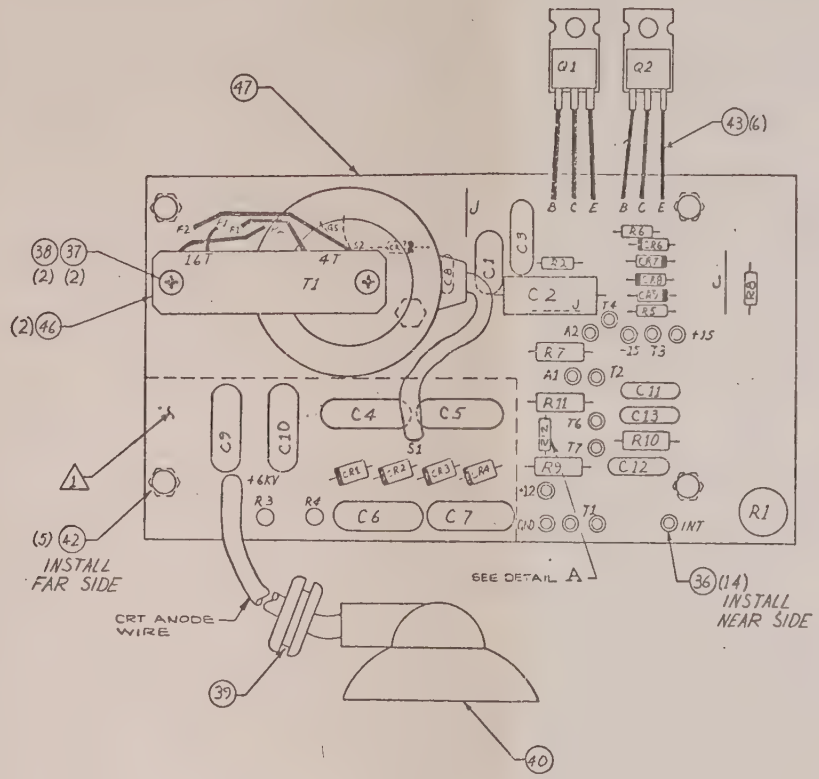
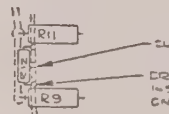
REV	DESCRIPTION	BY	DATE	APP'D
E	# 720			
F	# 732,773			
G	# 780			
H	# 704			
J	(A.I.) 58			
K	# 932			
L	# 1117			





DETAIL A
R12 INSTALLATION

2 SELECT R5 VALUE AT TEST (15K TO 30.1K) FOR 70mA DC ± 5mA WITH A CRT BEING POWERED BY THIS BOARD.

1 APPLY SILICONE RUBBER (ITEM 41) TO INDICATED AREA. MINIMUM THICKNESS 1/16" ON BOTH SIDES OF CIRCUIT BOARD. ENCAPSULATE ALL COMPONENTS; HEAVY BUILD UP REQUIRED AT BASE OF 6KV OUTPUT (CRT ANODE WIRE).

NOTE UNLESS OTHERWISE SPECIFIED

MATERIAL	DRAWN JW ADKIN	WAVETEK SAN DIEGO, CALIFORNIA
FINISH	MATERIAL	TITLE ASSEMBLY HIGH VOLTAGE SUPPLY
DO NOT SCALE DRAWING	VOLTAGE APPROV	
	TOLERANCES FRACTIONAL ± DECIMAL .XXX ± .XX ± ANGULAR ±	
	DO NOT SCALE DRAWING	SIZE A2
	SCALE 2:1	DWG NO 040-012 REV 1
		SHEET 2 OF 2

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REV	ECN	BY	DATE	APP

PARTS LIST

LINE NO.	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	CAPACITORS				
2	CERAMIC DISC .001μF	CRL	71590	DD102	1
3	CERAMIC DISC 6KV 470PF	SPRAGUE	56289	60GA-747	6
4	GAP CAP 1.5KV .01μF	CRL	71590	GAP-103	3
5	MYLAR 50V .22μF	TRW	84411	601PE	1
6	TANTALUM 35V 33μF	SPRAGUE	56289	196D336X9035TE4	1
7	MYLAR 200V .33μF	TRW	84411	X663P	1
8					
9					
10	DIODES				
11	FDH6666	FAIRCHILD	33888	FDH6666	4
12	SCH30	SEMTECH	14099	SCH-30	4
13	IN4005	G.I.	15281	IN4005	1
14					
15					
16	POTENTIOMETERS				
17	POTENTIOMETERS 100K	BECKMAN	80747	91AR100K	1
18					
19	RESISTORS				
20	METAL FILM 1/8W, 1% 24.9Ω	CORNING	16299	RN55D	1
21	METAL FILM 1/8W, 1% 4.75K	CORNING	16299	RN55D	1
22	METAL FILM 1/8W, 1% △1	CORNING	16299	RN55D	1
23	METAL FILM 1/8W, 1% 56.2K	CORNING	16299	RN55D	1
24	METAL FILM L/8W, 1% 10.0Ω	CORNING	16299	RN55D	1
25					
26	METAL FILM 1/4W, 1% 1M	CORNING	16299	RNL0D	6
27					
28	TRANSFORMER	WAVETEK	23338	8420-502	1
29					

PARTS LIST

LINE NO.	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
30	TRANSISTOR				
31	TIP 29	T.I.	01295	TIP29	1
32	TIP 30	T.I.	01295	TIP30	1
33					
34					
35					
36	AMP PIN	AMP	00779	61182-1	14
37	SCREW 4-40 X 2 PAN HEAD			COML	2
38	NUT, SELF LOCKING	SPS	56878	21FA-440	2
39	GROMMET	H.H. SMITH	03330	2175	1
40	HIGH VOLTAGE CABLE	INTER IMPORTERS		C8-50BR	1
41	SILICONE RUBBER	DOW CORNING	71984	3140	AR
42	STANDOFF, HEX, SWAGE	USECO	08245	1531-8-3/8	5
43	WIRE, TEFLON 1 1/2" LONG (BLK)	NATIONAL	04569	NE1934U	6
44					
45					
46	BRACKET, XFMR	WAVETEK	23338	A420-348	2
47	CIRCUIT BOARD	WAVETEK	23338	A420-112H	1

LINE ITEM REFERENCE LIST

REF DES	P/L LINE	REF DES	P/L LINE	REF DES	P/L LINE
C1	6	R1	17		
C2	7	R2	21		
C3	5	R3	16		
C4	3	R4	25		
C5	3	R5	22		
C6	3	R6	20		
C7	3	R7	26		
C8	2	R8	23		
C9	3	R9	35		
C10	3	R10	26		
C11	4	R11	26		
C12	4	R12	34		
C13	4				
		T1	28		
CR1	12				
CR2	12				
CR3	12				
CR4	12				
CR5	13				
CR6	11				
CR7	11				
CR8	11				
CR9	11				
Q1	31				
Q2	32				

NOTE UNLESS OTHERWISE SPECIFIED

DRAWN	WAVETEK SAN DIEGO, CALIFORNIA	
CHECKED	TITLE ASSEMBLY HIGH VOLTAGE SUPPLY	
RELEASE APPROV		
DIMENSIONS ARE IN INCHES	SIZE A3	DWG NO. 8420-01
SCALE —/—		REV 1

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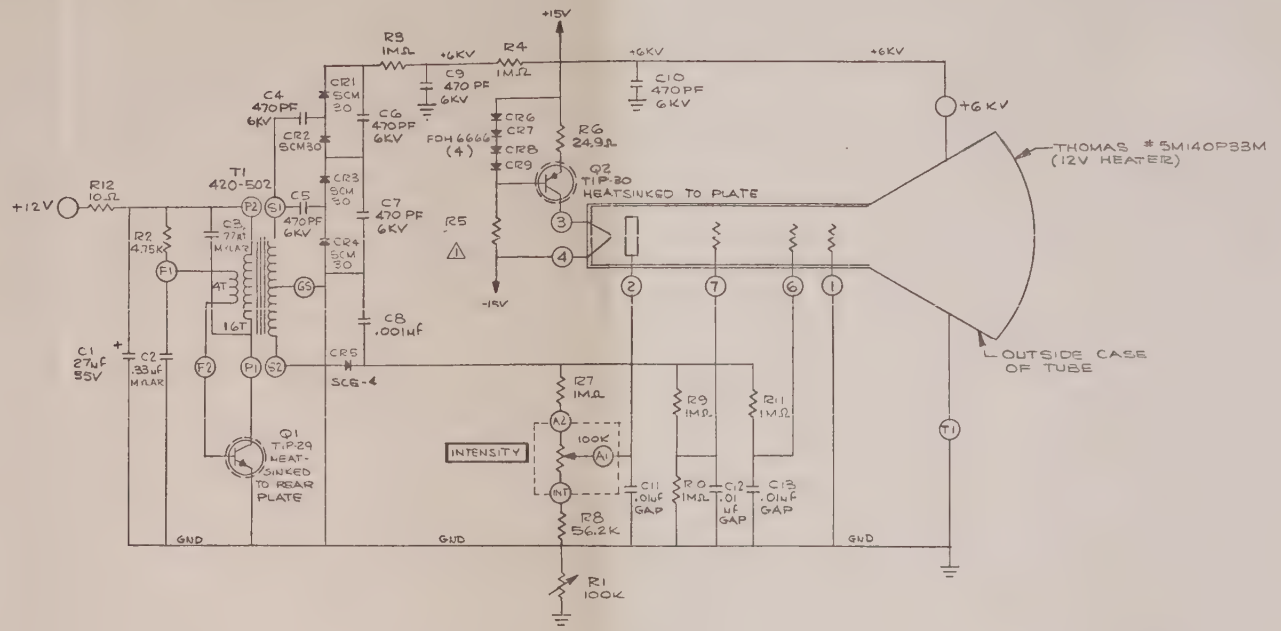

LAST REF. DESIG USED: C13, CR9, Q2, R12, T1

⚠ R5 VALUE TO BE SELECTED IN THE (15K TO 20.1K) FOR 70ma DC ±5ma WITH A CRT BEING POWERED BY THIS BOARD.

NOTE UNLESS OTHERWISE SPECIFIED

WAVETEK SAN DIEGO, CALIFORNIA

4 VOLTAGE

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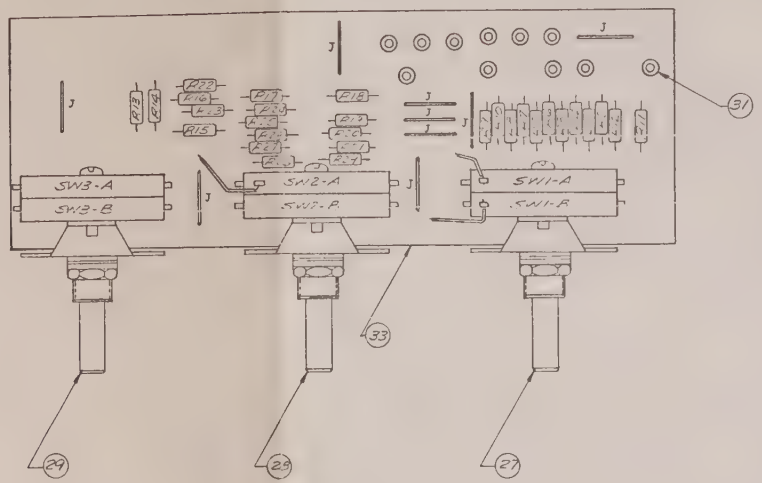
D		ECN		BY	DATE	APP
G		REDRAWN				
F						



NOTE UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND BREAK SHARP EDGES

MATERIAL

WAVETEK PROCESS

DRAWN M. BOCHICHIO 6/21/79

PROJECTION

WAVETEK SAN DIEGO, CA. U.S.A.

ASSEMBLY ATTENUATOR

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION AND DESIGN RIGHTS BELONGING TO WAVETEK AND MAY NOT BE REPRODUCED FOR ANY PURPOSE WITHOUT WRITTEN AUTHORIZATION.

PARTS LIST

ILINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	RESISTOR				
2	METAL FILM, 1/8W, 1% 10Ω	CORNING	16299	RN55D	2
3	METAL FILM, 1/8W, 1%, 21.5Ω	CORNING	16299	RN55D	1
4	METAL FILM, 1/8W, 1%, 39.2Ω	CORNING	16299	RN55D	2
5	METAL FILM, 1/8W, 1%, 46.4Ω	CORNING	16299	RN55D	1
6	METAL FILM, 1/8W, 1%, 54.9Ω	CORNING	16299	RN55D	1
7	METAL FILM, 1/8W, 1%, 90.9Ω	CORNING	16299	RN55D	1
8	METAL FILM, 1/8W, 1%, 124Ω	CORNING	16299	RN55D	1
9	METAL FILM, 1/8W, 1%, 150Ω	CORNING	16299	RN55D	1
10	METAL FILM, 1/8W, 1%, 182Ω	CORNING	16299	RN55D	1
11	METAL FILM, 1/8W, 1%, 200Ω	CORNING	16299	RN55D	2
12	METAL FILM, 1/8W, 1%, 249Ω	CORNING	16299	RN55D	1
13	METAL FILM, 1/8W, 1%, 274Ω	CORNING	16299	RN55D	2
14	METAL FILM, 1/8W, 1%, 301Ω	CORNING	16299	RN55D	3
15	METAL FILM, 1/8W, 1%, 316Ω	CORNING	16299	RN55D	1
16	METAL FILM, 1/8W, 1%, 332Ω	CORNING	16299	RN55D	2
17	METAL FILM, 1/8W, 1%, 464Ω	CORNING	16299	RN55D	1
18	METAL FILM, 1/8W, 1%, 499Ω	CORNING	16299	RN55D	1
19	METAL FILM, 1/8W, 1%, 511Ω	CORNING	16299	RN55D	1
20	METAL FILM, 1/8W, 1%, 523Ω	CORNING	16299	RN55D	1
21	METAL FILM, 1/8W, 1%, 909Ω	CORNING	16299	RN55D	1
22	METAL FILM, 1/8W, 1%, 3.01K	CORNING	16299	RN55D	1
23	METAL FILM, 1/8W, 1%, 9.53K	CORNING	16299	RN55D	1
24					
25					
26					
27	SWITCH ASSY	WAVETEK	23333	A420-A06	1
28	SWITCH ASSY	WAVETEK	23333	A420-A07	1
29	SWITCH ASSY	WAVETEK	23333	A420-A08	1

PARTS LIST

ILINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
30					
31	AMP PINS	AMP	00779	61182-2	11
32					
33	CIRCUIT BOARD	WAVETEK	23333	A420-111E	1
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
45					
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47					
48					
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					

LINE ITEM REFERENCE LIST

REF DES	P/L LINE	REF DES	P/L LINE	REF DES	P/L LINE
R1	23	R21	11		
R2	10	R22	12		
R3	22	R23	14		
R4	6	R24	7		
R5	21	R25	15		
R6	4	R26	6		
R7	13	R27	13		
R8	2	R28	5		
R9	9	R29	12		
R10	8				
R11	3				
R12	2				
R13	17				
R14	15				
R15	19	SW1	27		
R16	11	SW2	28		
R17	16	SW3	29		
R18	16				
R19	20				
R20	18				

NOTE UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND BREAK SHARP EDGES	DRAWN M. Bochich	WAVETEK SAN DIEGO, CALIFORNIA	
MATERIAL		TITLE ASSEMBLY ATTENUATOR (RECEIVER)	
FINISH WAVETEK PROCESS	TOLERANCE IN ± OTHERWISE SPECIFIED .XX ± .010 ANGLES ± 1° .XXX ± .005		
	UNITS MM / INCH	SERIES 420	DWG NO B420-020 REV F
	SCALE	CAGE NO 23333	SHT 2 OF 2

B420-020 F

8 7 6 5 4 3 2 1

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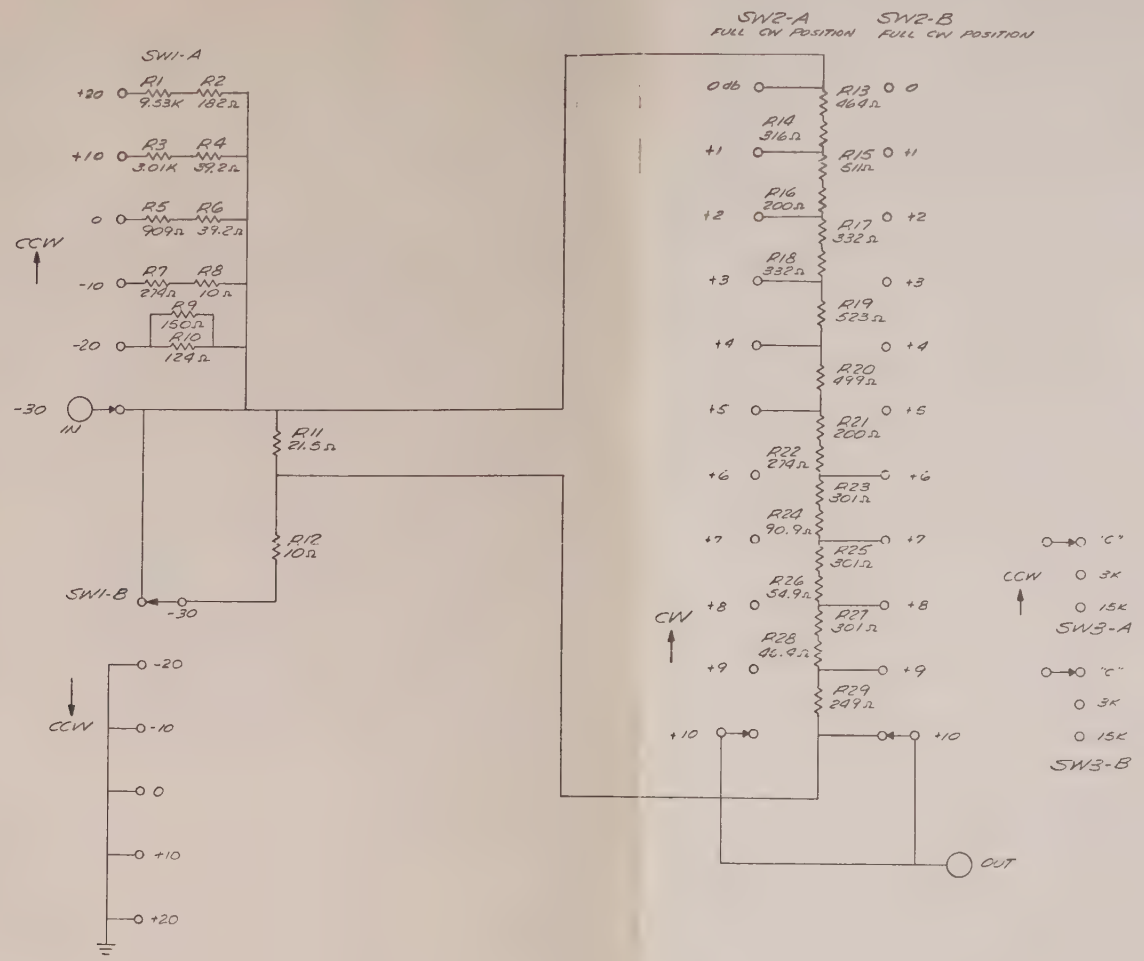
PL.	ECN	BY	DATE
A	ECN 12497		



LAST REF DES USED
R29 SW3

NOTE UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND BREAK SHARP EDGES
MATERIAL
DRAWN
WAVETEK SAN DIEGO, CALIFORNIA
TITLE

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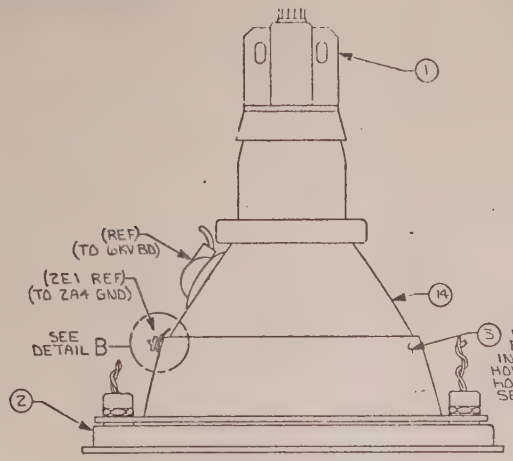
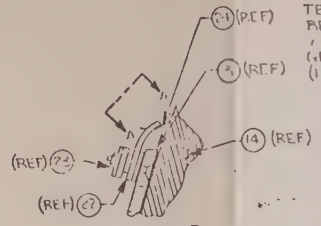
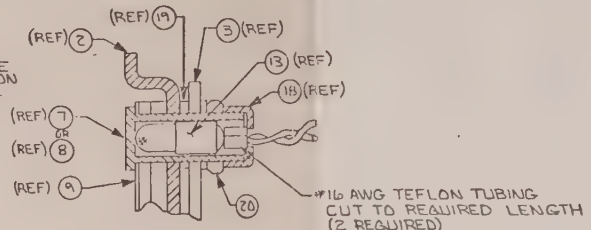




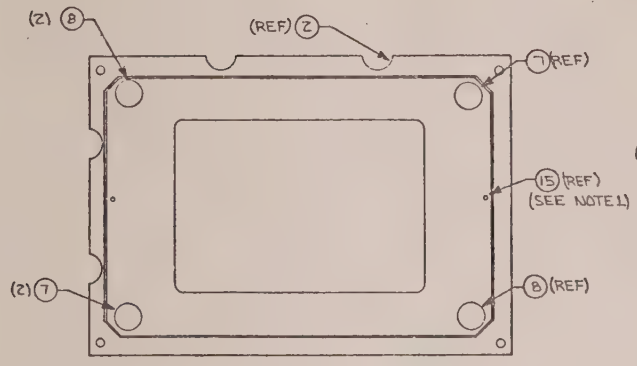
DETAIL B
SCALE: 2/1

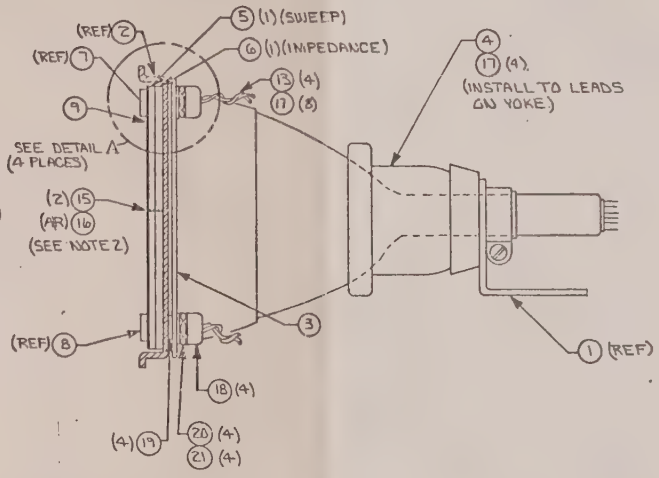
TENSION SHOULD BE ON WIRE (ITEM 14) SO IT WILL GROUND TO CRT (ITEM 19)

VIEW A-A



DETAIL A
SCALE: 2/1





PARTS LIST					
ITEM	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	PANEL ASSY, TUBE MTG	WAVETEK	23338	D420-343	1
2	PANEL, TUBE	WAVETEK	23338	B420-334	1
3	TUBE HOLDER	WAVETEK	23338	C420-338	1
4	YOKE	WAVETEK	23338	B420-503	1
5	GRADICULE, SWEEP	WAVETEK	23338	C420-335	1
6	GRADICULE, IMPEDANCE	WAVETEK	23338	C420-341	1
7	LAMP HOUSING	WAVETEK	23338	B420-336	2
8	LAMP HOUSING	WAVETEK	23338	B420-337	2
9	POLAROID SCREEN	WAVETEK	23338	B420-343	1
10					
11					
12					
13	LAMP	MURA	32539	L28/40	4
14	CRT TUBE 5"	THOMAS	01352	SM140P33M	1
15	PIN 3/32 DIA. x 1/4 LONG	CEM	00287	3/32 x 1/4 MCK	2
16	TAPE, POLYSTER (SILVER	SCOTCH-3M	26066	850	50"
17	AMP PIN FEMALE	AMP	00779	60598-8	12
18	END BUMPER	BARRY INDS	98398	LC9315	4
19	WASHER NYLON	SHAKEPROOF	06540	2264-N-385	4
20	NUT 3/8-32 NEF	COML			4
21	LOCK WASHER 3/8	COML			4
22	SOLDER LUG #4	H H SMITH	83330	1414-4	1
23	SCREW SELF LOCKING #4-40	SPS	56878	21-FA-440	1
24	WIRE 1A PHOSPHOR BRONZE WIRE	COML			1.5"

2. COVER EDGES WITH CONTINUOUS WRAP OF (ITEM 16) POLYSTER TAPE. OVER LAP ENDS.
1. INSTALL PINS, (ITEM 15) THRU BOTH GRADICULES.

NOTE UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND BREAK SHARP EDGES	DRAWN ADKINS	WAVETEK SAN DIEGO, CALIFORNIA	
		TITLE ASSEMBLY CATHODE RAY TUBE (2A5) RECEIVER	
DO NOT SCALE DRAWING	SCALE FULL	MODEL NO 420	DWG NO D420-042 REV
		FSCM NO 23338	SHEET 01 1

D420-042

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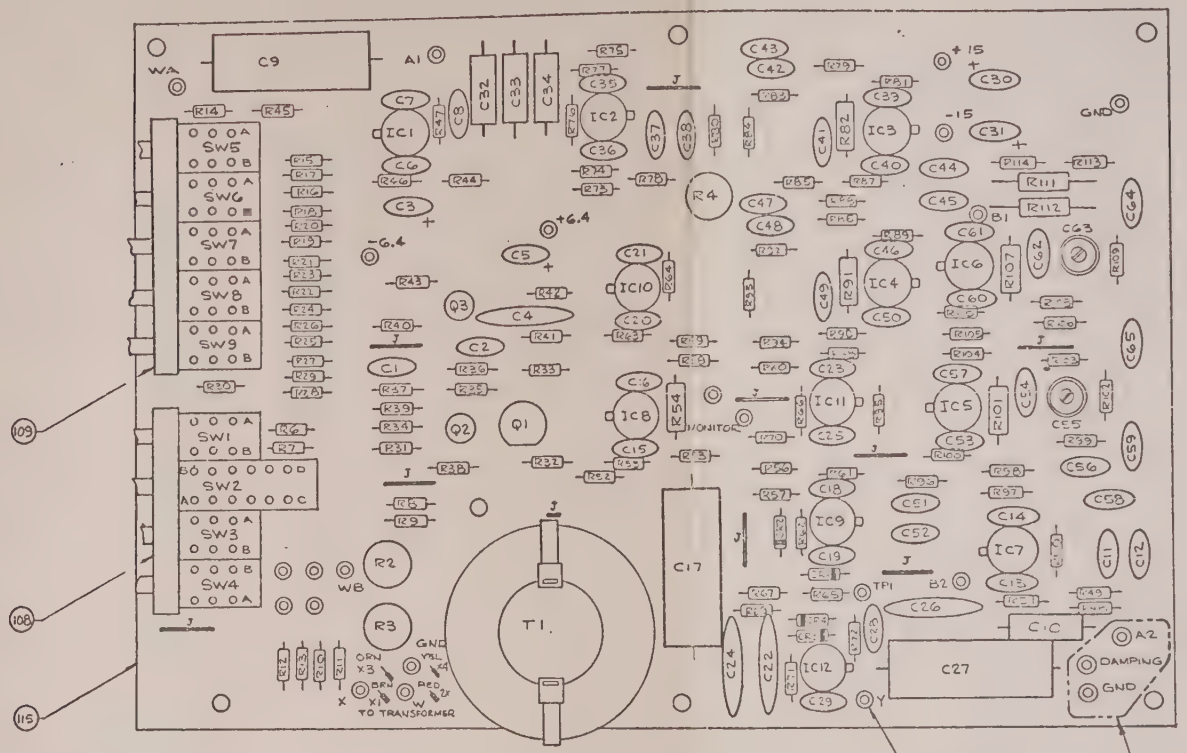
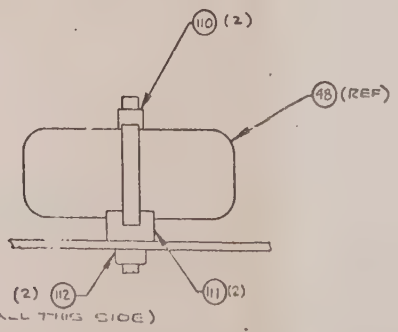
REV	ECN	BY	DATE	APP
E	# 709, 710, 712			
F	# 732, 773			
G	ECN 1070			





NOTE UNLESS OTHERWISE SPECIFIED

WAVETEK SAN DIEGO, CALIFORNIA

ASSEMBLY
NOISE AMPLIFIER & MESSAGE FILTER
(T1 NOT PCB)

420 | 1420-015 | G

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PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	SILVER MICA 500V 10% 20PF	ARCO	02799	DM15-200J	2
2	CERMAIC DISC 1000V 10% 22PF	CRL	71590	DD220	2
3	SILVER MICA 500V 5% 30PF	ARCO	02799	DM15-300J	1
4	SILVER MICA 500V 5% 47PF	APCO	02799	DM15-470J	1
5	CERAMIC DISC 1000V 10% 47PF	CRL	71590	DD470	2
6	SILVER MICA 500V 5% 56PF	ARCO	02799	DM15-560J	2
7	CERAMIC DISC 1000V 10% 220PF	CRL	71590	DD221	8
8	CERAMIC DISC 1000V 10% 470PF	CRL	71590	DD471	2
9	SILVER MICA 500V 5% 470PF	ARCO	02799	DM15-471J	2
10	SILVER MICA 500V 5% 750PF	ARCO	02799	DM15-751J	1
11	SILVER MICA 500V 5% .0020UF	ARCO	02799	DM19-202J	9
12	SILVER MICA 500V 5% .0022UF	ARCO	02799	DM19-222J	5
13	SILVER MICA 500V 5% .0033UF	ARCO	02799	DM19-332J	1
14	CERAMIC DISC 50V 10% .005UF	CRL	71590	CK502	8
15	CERAMIC DISC 1000V 10% .001UF	CRL	71590	DD102	2
16	MYLAR 50V 10% .22UF	TRW		601PE	4
17	POLYSTYRENE 100V 10% .01UF	IMB		PA2B103F	4
18	MYLAR 200V 10% 2UF	AMERICAN RADIONICS	07994	2MFW205K	3
19	TANTALUM 35V 33UF	SPRAGUE	56289	196D336X9035TE4	4
20					
21	VARICAP 3-13PF	STETNER		75-TRIKO-02-3/13	1
22	VARICAP 7-35PF	STETNER		75-TRIKO-02-7/35	1
23					
24					
25					
26					
27	DIODE				
28	GERMANIUM G.P.	GENERAL ELECTRIC		1N54	2
29	SILICON G.P.	FAIRCHILD	53888	FD6666	2
30					
31					
32					
33					
34					
35					
36					
37					
38					
39	INTEGRATED CIRCUITS				
40	μA709C C4-II C2-I	FAIRCHILD	33888	μA709C 13 (MT)	12
41					
42					
43	POTENTIOMETERS				
44	10K	BECKMAN	80740	91AR10K	2
45	100K	BECKMAN	80740	91AR100K	1
46					
47	TRANSFORMER				
48	6122B	WAVETEK	23338	B420-509	1
49					
50					
51	TRANSISTOR				
52	TO101	SPRAGUE	56289	TO101	1
53	2N3565	FAIRCHILD	33888	2N3565	1
54	2N4250	FAIRCHILD	33888	2N4250	1
55					
56					
57					

NOTE UNLESS OTHERWISE SPECIFIED

PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
58					
59	RESISTORS				
60	METAL FILM, 1/8W, 1%, 100Ω	CORNING	16299	RN55D	1
61	METAL FILM, 1/8W, 1%, 150Ω	CORNING	16299	RN55D	1
62	METAL FILM, 1/8W, 1%, 499Ω	CORNING	16299	RN55D	2
63	METAL FILM, 1/8W, 1%, 511Ω	CORNING	16299	RN55D	1
64	METAL FILM, 1/8W, 1%, 750Ω	CORNING	16299	RN55D	1
65					
66					
67	METAL FILM, 1/8W, 1%, 1.00K	CORNING	16299	RN55D	3
68	METAL FILM, 1/8W, 1%, 1.50K	CORNING	16299	RN55D	12
69	METAL FILM, 1/8W, 1%, 4.99K	CORNING	16299	RN55D	5
70	METAL FILM, 1/8W, 1%, 7.15K	CORNING	16299	RN55D	2
71					
72	METAL FILM, 1/8W, 1%, 9.53K	CORNING	16299	RN55D	2
73	METAL FILM, 1/8W, 1%, 10.5K	CORNING	16299	RN55D	7
74	METAL FILM, 1/8W, 1%, 13.0K	CORNING	16299	RN55D	4
75	METAL FILM, 1/8W, 1%, 15.0K	CORNING	16299	RN55D	1
76	METAL FILM, 1/8W, 1%, 17.4K	CORNING	16299	RN55D	2
77	METAL FILM, 1/8W, 1%, 19.6K	CORNING	16299	RN55D	1
78	METAL FILM, 1/8W, 1%, 20.5K	CORNING	16299	RN55D	2
79	METAL FILM, 1/8W, 1%, 24.9K	CORNING	16299	RN55D	7
80	METAL FILM, 1/8W, 1%, 27.4K	CORNING	16299	RN55D	2
81	METAL FILM, 1/8W, 1%, 30.1K	CORNING	16299	RN55D	4
82	METAL FILM, 1/8W, 1%, 35.7K	CORNING	16299	RN55D	1
83	METAL FILM, 1/8W, 1%, 40.2K	CORNING	16299	RN55D	6
84	METAL FILM, 1/8W, 1%, 41.2K	CORNING	16299	RN55D	1
85					
86	METAL FILM, 1/8W, 1%, 47.5K	CORNING	16299	RN55D	3
87	METAL FILM, 1/8W, 1%, 49.9K	CORNING	16299	RN55D	1
88	METAL FILM, 1/8W, 1%, 56.2K	CORNING	16299	RN55D	1
89	METAL FILM, 1/8W, 1%, 76.8K	CORNING	16299	RN55D	4
90	METAL FILM, 1/8W, 1%, 100K	CORNING	16299	RN55D	16
91					
92	METAL FILM, 1/8W, 1%, 124K	CORNING	16299	RN55D	2
93	METAL FILM, 1/8W, 1%, 178K	CORNING	16299	RN55D	3
94	METAL FILM, 1/8W, 1%, 237K	CORNING	16299	RN55D	2
95	METAL FILM, 1/8W, 1%, 301K	CORNING	16299	RN55D	2
96	METAL FILM, 1/8W, 1%, 402K	CORNING	16299	RN55D	1
97	METAL FILM, 1/4W, 1%, 464K	CORNING	16299	RN60D	2
98	METAL FILM, 1/4W, 1%, 499K	CORNING	16299	RN60D	1
99	METAL FILM, 1/4W, 1%, 698K	CORNING	16299	RN60D	1
100					
102					
103	METAL FILM, 1/4W, 1%, 1M	CORNING	16299	RN60D	1
104	METAL FILM, 1/2W, 1%, 2M	CORNING	16299	RN65D	2
105					
106					
107					
108	SWITCHES	WAVETEK	23338	B420-405	1
109	SWITCHES	WAVETEK	23338	B420-404	1
110	TIE STRAP	PANDUIT	06383	SST-1.5M	2
111	MTG BLOCK	PANDUIT	06383	TM-256C	2
112	SWAGE STANDOFF	AMATOM	06540	9531B-B-0440-3A	2
113	AMP PINS	AMP	00779	61182-2	24
114					
115	CIRCUIT BOARD	WAVETEK	23338	420-115E	1

LINE ITEM REFERENCE LIST

REF DES	P/L LINE	REF DES	P/L LINE	REF DES	P/L LINE
C1	1	IC1	40	R19	81
C2	9	IC2	40	R13	79
C3	19	IC3	40	R1[illegible]	68
C4	16	IC4	40	R12	79
C5	18	IC5	40	R13	68
C6	8	IC6	40	P14	88
C7	2	IC7	40	R15	83
C8	1	IC8	40	R16	73
C9	18	IC9	40	R17	83
C10	17	IC10	40	R18	68
C11	11	IC11	40	R19	83
C12	11	IC12	40	R20	67
C13	14			R21	92
C14	7	Q1	53	R22	68
C15	8	Q2	53	R23	81
C16	2	Q3	54	R24	81
C17	18			R25	86
C18	15			R26	86
C19	5	R1	NOT USED	R27	68
C20	15	R2	44	R28	90
C21	5	R3	44	R29	90
C22	16	R4	45	R30	90
C23	14	R5	NOT USED	R31	68
C24	16	R6	62	R32	97
C25	7	R7	60	R33	93
C26	16	R8	64	R34	93
C27	18	R9	61	R35	87
C28	14	R10	83	R36	90
C29	7	R11	63	R37	90
C30	19	R12	83	R38	89
C31	19	R13	83	R39	68
C32	17	R14	79	R40	90
C33	17	R15	70	R41	97
C34	17	R16	84	R42	85
C35	14	R17	70	R43	89
C36	7	R18	74	R44	88
C37	11	R19	76	R45	90
C38	12	R20	74	R46	90
C39	14	R21	74	R47	90
C40	7	R22	76	R48	90
C41	6	R23	74	R49	80
C42	11	R24	78	R.10	68
C43	9	R25	69	R.21	103
C44	11	R26	78	R.22	90
C45	12	R27	79	R.33	80
C46	14	R28	62	R.34	90
C47	10	R29	79	R.35	90
C48	11	R30	79	R.36	95
C49	6	R31	67	R.37	99
C50	7	R32	94	R.38	90
C51	11	R33	94	R.39	69
C52	12	R34	92	R.10	68
C53	14	R35	73	R.11	104
C54	4	R36	73	R.12	104
C55	22	R37	95	R.13	90
C56	13	R38	82	R.14	69
C57	7	R39	73		
C58	11	R40	93		
C59	12	R41	86		
C60	14	R42	75	S#1	108
C61	7	R43	73	S#2	108
C62	3	R44	73	S#3	108
C63	21	R45	73	S#4	108
C64	11	R46	68	S#5	109
C65	12	R47	95	S#6	109
		R48	72	S#7	109
		R49	72	S#8	109
		R50	81	S#9	109
		R51	68		
CR1	28	R52	69		
CR2	28	R53	69	T1	48
CR3	29	R54	96		
CR4	29	R55	68		
		R56	67		
		R57	77		
		R58	79		

REV	ECN	BY	DATE	APP

MATERIAL	DRAWN P.A. PHELPS	WAVETEK SAN DIEGO, CALIFORNIA	
	CHECKED	TITLE ASSEMBLY NOISE AMPLIFIER / MESSAGE FILTER (RECIEVER)	
	MILITARY APPROVAL	SIZE A2	DWG NO B420-015
	APPROVED	SCALE	SHEET

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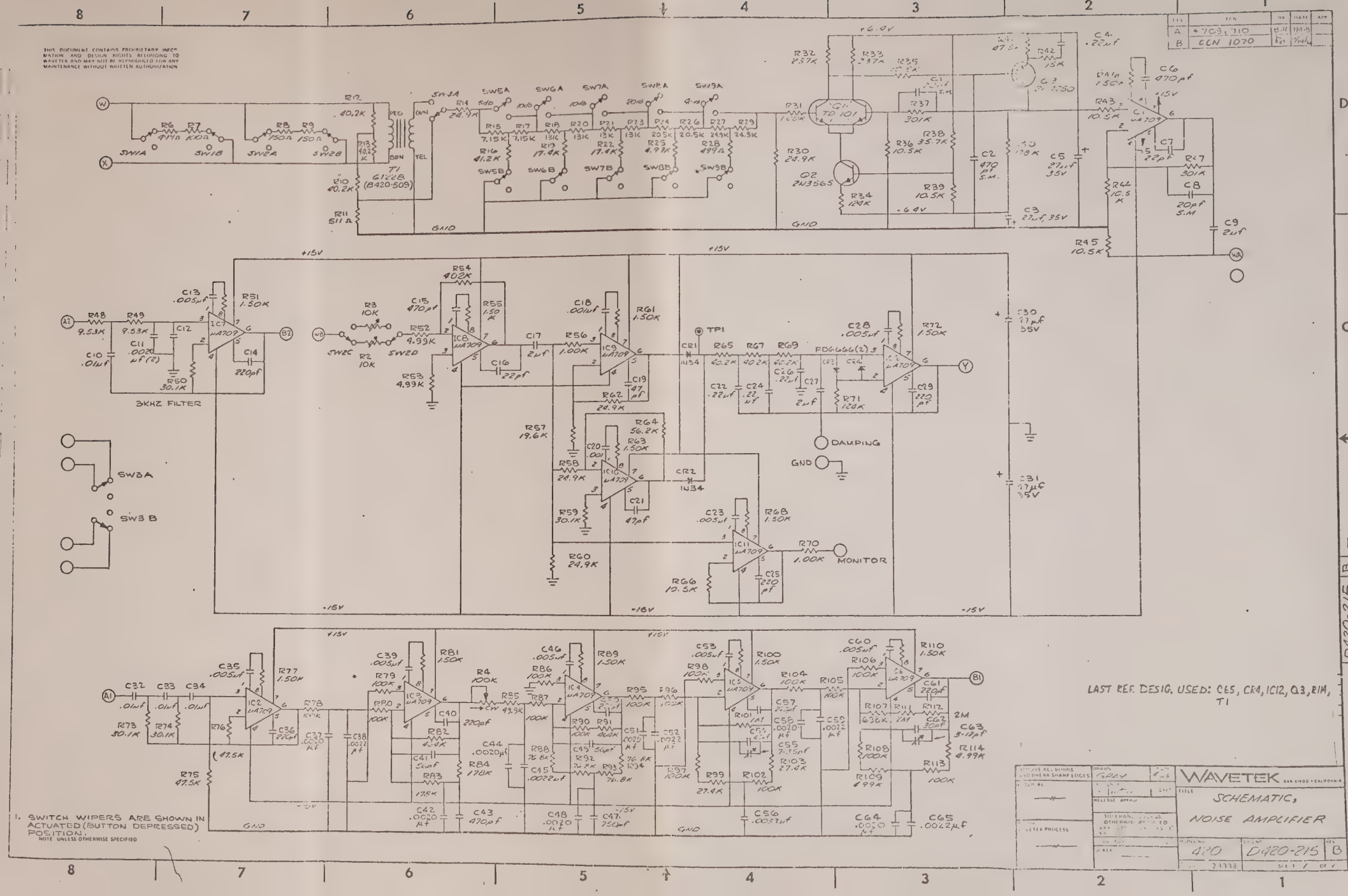
LTR	ECN	INIT	DATE	APP
A	ECN 1070			
B	ECN 1070			



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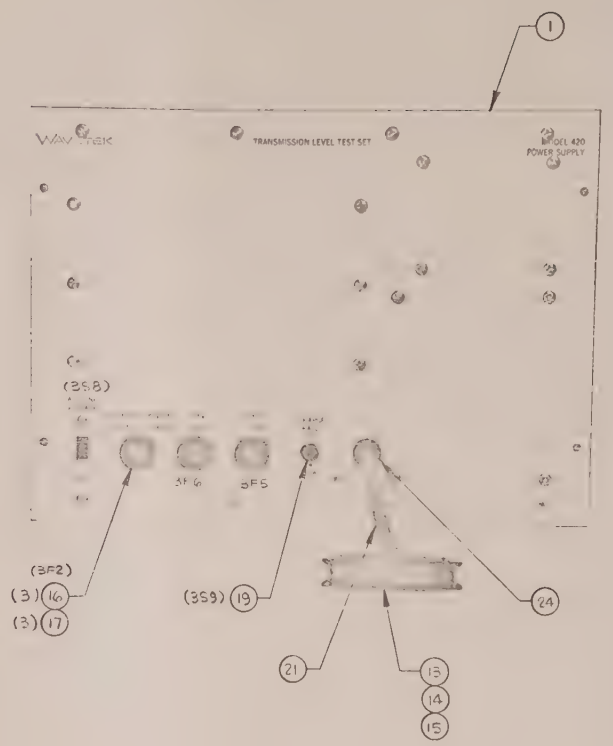

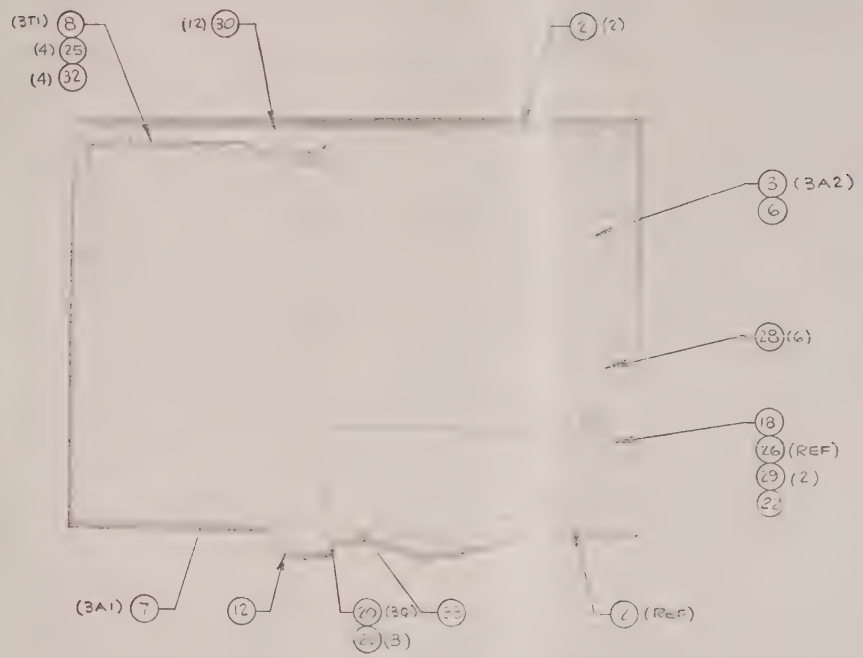

INSTALL TRANSISTOR USING
HEAT SINK COMPOUND, MICA
INSULATOR & NYLON SHOULDER
WASHER

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PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	FRONT PANEL	WAVETEK	23338	C420-304	1
2	SUPPORT ANGLE	WAVETEK	23338	B420-347	2
3	BATTERY HOLDER	WAVETEK	23338	C420-324	1
4					
5					
6	BATTERY ASSY	WAVETEK	23338	C420-005	1
7	BATTERY CHARGER BD	WAVETEK	23338	D420-021	1
8	TRANSFORMER	WAVETEK	23338	B420-527	1
9					
10					
11					
12	A.C. RECPTACLE	SWITCHCRAFT	82389	EAC-301	1
13	CONNECTOR	CANNON	31746	DBC-25S	1
14	JUNCTION SHELL	CANNON	31746	DB51212-1	1
15	END DISC LATCH	CANNON	31746	D110278	1
16	FUSE HOLDER	LITTLEFUSE	75915	345001	3
17	FUSE, 1/2 AMB SLO BLO	LITTLEFUSE	75915	313.500	3
18	SWITCH 115/230	SWITCHCRAFT	82389	46256LF	1
19	SWITCH SPST	C&K	09353	7101-PDCN	1
20	TRANSISTOR TIP 30	T.I.	01295	TIP-30	1
21	CABLE, 12 CONDUCTOR	BELDEN	16428	B457-100	22"
22	GUARD, SOLDER	SWITCHCRAFT	82389	46256-LF-SG	1
23					
24	GROMMET	H.H. SMITH	83330	91117	1
25	SPACER	H.H. SMITH	83330	8713	4
26					
27					
28	SPEED NUT	TINNERMAN	78553	C880-632	6
29	NUT, SELF LOCKING #4	SPS	56878	21-FA-440	2

PARTS LIST

LINE NO	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
30	NUT, SELF LOCKING #6	SPS	56878	21-FA-632	12
31					
32	SCREW, #6-32 X 2" LONG	COML			4
33	SOLDER LUG	H.H. SMITH	83330	1414-4	1

NOTE UNLESS OTHERWISE SPECIFIED

REMOVE ALL BURRS AND BREAK SHARP EDGES

WAVETEK

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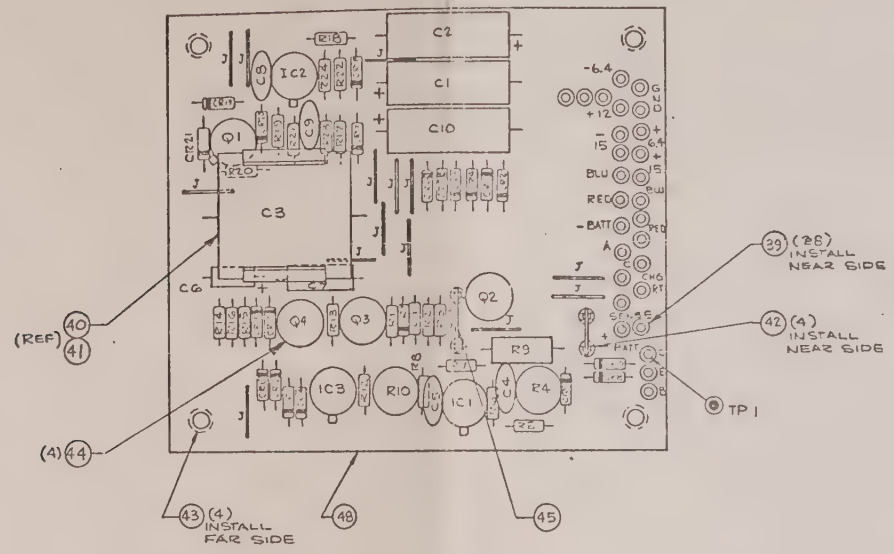
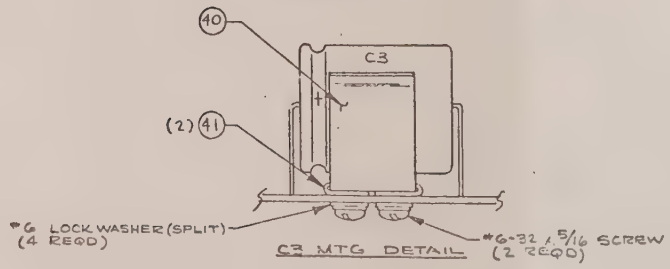
REV	ECN	BY	DATE	APP
C	ECN 752, 773			
D	ECN 911			
E	ECN 933			
F	ECN 954			





C3 MTG DETAIL

NOTE UNLESS OTHERWISE SPECIFIED

WAVETEK SAN DIEGO, CALIFORNIA

ASSEMBLY BATTERY CHARGER BD (BAT) RECEIVER

DWG NO. D420-021 REV F

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REV	ECN	BY	DATE	APP

PARTS LIST

LINE NO.	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
1	CAPACITOR CERAMIC DISC .005μF	CRL	71590	CK502	2
2	CERAMIC DISC 220PF	CRL	71590	DD221	2
3	TANTALUM .47μF	SPRAGUE	56289	150D474X9050B2	1
4	TANTALUM 10μF	SPRAGUE	56289	150D106X9020B2	1
5	ELECTROLYTIC 50V 50μF	SPRAGUE	56289	5000506G050D7	3
6	ELECTROLYTIC 75V 250μF	SPRAGUE	56289	390257G075JE4	1
7					
8					
9	DIODE 6.4V ZENER	DICKSON	12954	IN4581	3
10	DIODE 100V G.P. SILCON	MOTOROLA	04713	1N4002	7
11	DIODE 100V G.P. SILCON	FAIRCHILD	33888	FD6656	10
12	DIODE 6.4V ZENER	DICKSON	12954	IN4581 (-84)	1
13					
14	INTEGRATED CIRCUITS				
15	INTEGRATED CIRCUITS μA709	FAIRCHILD	33888	μA709C (-13) (-14)	2
16	INTEGRATED CIRCUITS μA709	FAIRCHILD	33888	μ A709C (-44)	1
17					
18					
19	TRANSISTOR 2N2219A	FAIRCHILD	33888	2N2219A	1
20	TRANSISTOR 2N3642	FAIRCHILD	33888	2N3642	1
21	TRANSISTOR 2N3643	FAIRCHILD	33888	2N3643	2
22					
23	RESISTOR 1W 5% 470Ω	STACKPOLE	29604	RC32GF471J	1
24	METAL FILM, 1/8W, 1%, 15Ω	CORNING	16299	RN55D	1
25	METAL FILM, 1/8W, 1%, 499Ω	CORNING	16299	RN55D	1
26	METAL FILM, 1/8W, 1%, 1K	CORNING	16299	RN55D	4
27	METAL FILM, 1/8W, 1%, 1.5K	CORNING	16299	RN55D	3
28	METAL FILM, 1/8W, 1%, 3.32K	CORNING	16299	RN55D	1
29	METAL FILM, 1/8W, 1%, 7.5K	CORNING	16299	RN55D	1

PARTS LIST

LINE NO.	DESCRIPTION	MFGR	FSCM	MFGR P/N	QTY
30	METAL FILM, 1/8W, 1%, 10K	CORNING	16299	RN55D	2
31	METAL FILM, 1/8W, 1%, 10.5K	CORNING	16299	RN55D	1
32	METAL FILM, 1/8W, 1%, 19.6K	CORNING	16299	RN55D	1
33	METAL FILM, 1/8W, 1%, 49.9K	CORNING	16299	RN55D	2
34	METAL FILM, 1/8W, 1%, 65.8K	CORNING	16299	RN55D	1
35	METAL FILM, 1/8W, 1%, 100K	CORNING	16299	RN55D	1
36	METAL FILM, 1/8W, 1%, 301K	CORNING	16299	RN55D	1
37	POTENTIOMETER 100Ω	BECKMAN	80740	91AR100Ω	1
38	POTENTIOMETER 10K	BECKMAN	80740	91AR10K	1
39	AMP PINS	AMP	00779	61182-2	28
40	CLAMP	SEASTROM	86928	4511-100-68-2C	1
41	TINNERMAN CLIPS	TINNERMAN	78553	CBBO-632	2
42	TERMINALS	USECO	88245	2000B-1	4
43	SWAGE STANDOFFS	USECO	88245	1530B-1/4-11	4
44	TRANSISTOR PAD	MILTON ROSS	67047	10123N	4
45	RESISTANCE WIRE	WILBER DRIVER	72005	30AWG (30PER FOOT)	AR
46					
47					
48	CIRCUIT BOARD	WAVETEK	22338	420-1108	1
49					
50					
51					
52					
53					
54					
55					
56					
57					

LINE ITEM REFRENCE LIST

REF DES	P/L LINE
C1	5
C2	5
C3	6
C4	1
C5	2
C6	3
C7	4
C8	2
C9	1
C10	5
CR1	10
CR2	10
CR3	10
CR4	10
CR5	10
CR6	10
CR7	9
CR8	11
CR9	11
CR10	10
CR11	11
CR12	11
CR13	11
CR14	11
CR15	11
CR16	11
CR17	9
CR18	12
CR19	11
CR20	9
CR21	11

REF DES	P/L LINE
IC1	16
IC2	15
IC3	15
Q1	19
Q2	20
Q3	21
Q4	21
R1	32
R2	30
R3	33
R4	37
R5	26
R6	27
R7	26
R8	26
R9	23
R10	38
R11	34
R12	33
R13	35
R14	26
R15	30
R16	36
R17	28
R18	27
R19	25
R20	24
R21	27
R22	29
R23	32
R24	31
R25	45

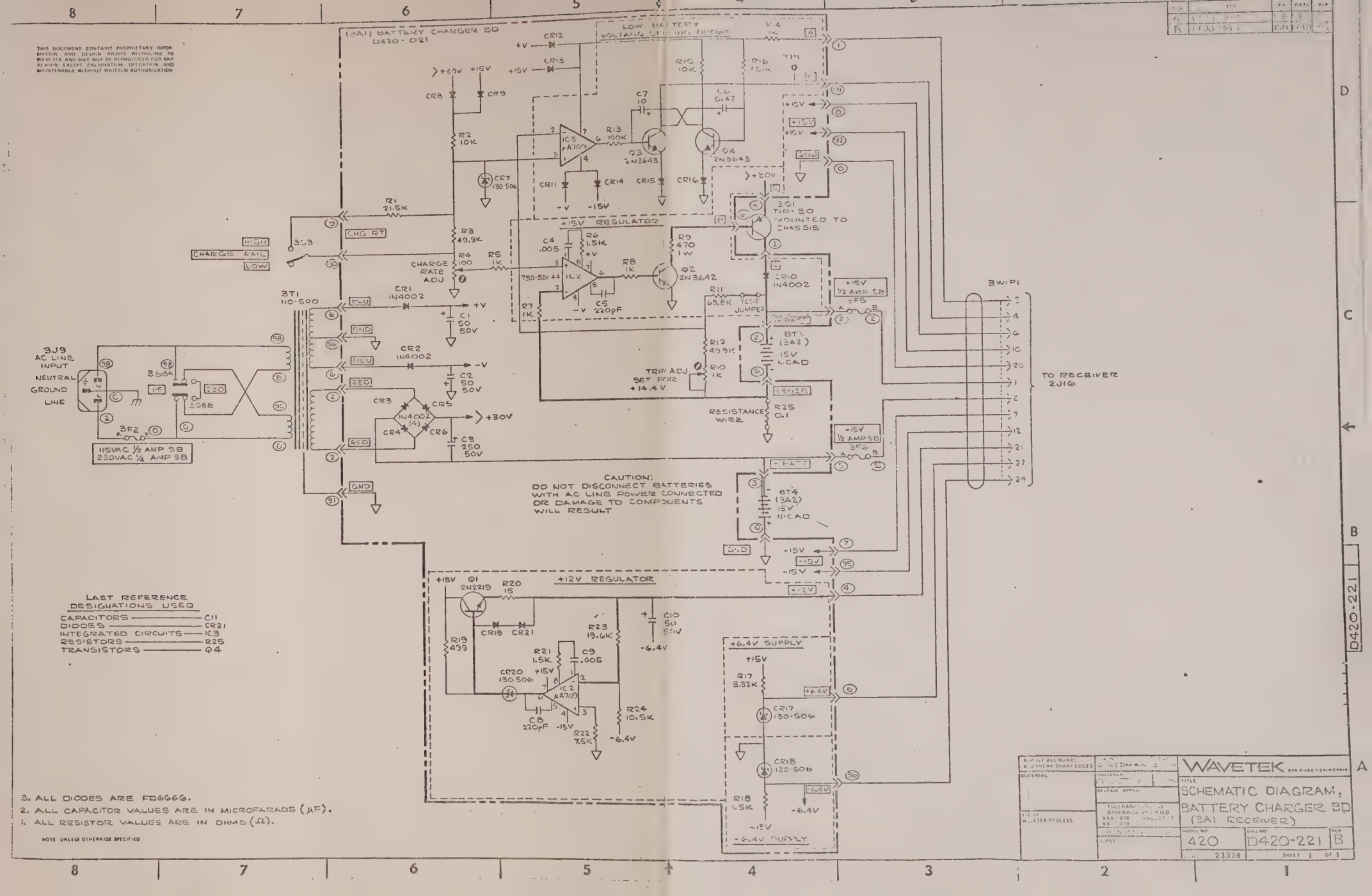
NOTE UNLESS OTHERWISE SPECIFIED

WAVETEK SAN DIEGO, CALIFORNIA

ASSEMBLY
BATTERY CHARGER BC
(RECEIVER)

SCALE —/ | SIZE A | DWG NO. B40-021 | REV F

SHEET 1 OF 1


(3A1) BATTERY CHARGER BD
D420-021
LOW BATTERY VOLTAGE SENSING CIRCUIT
+15V REGULATOR
+12V REGULATOR
+6.4V SUPPLY
-6.4V SUPPLY
CHARGE RATE ADJ
TRIP ADJ SET FOR +14.4 V
RESISTANCE WIRE
TEST JUMPER
TO RECEIVER 2J16
3J9 AC LINE INPUT NEUTRAL GROUND LINE
115VAC ½ AMP SB
230VAC ¼ AMP SB
CAUTION: DO NOT DISCONNECT BATTERIES WITH AC LINE POWER CONNECTED OR DAMAGE TO COMPONENTS WILL RESULT
LAST REFERENCE DESIGNATIONS USED
CAPACITORS — C11
DIODES — CR21
INTEGRATED CIRCUITS — IC3
RESISTORS — R25
TRANSISTORS — Q4
3. ALL DIODES ARE FD6666.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS (μF).
1. ALL RESISTOR VALUES ARE IN OHMS (Ω).
NOTE UNLESS OTHERWISE SPECIFIED

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WAVETEK SAN DIEGO • CALIFORNIA

TITLE: SCHEMATIC DIAGRAM, BATTERY CHARGER BD (3A1 RECEIVER)

MODEL NO 420 | DWG NO D420-221 | REV B

SHEET 1 OF 1

REV	ECN	BY	DATE	APP
B	ECN 1119	AT	10/24/94	

REMOVE ALL BURRS AND BREAK SHARP EDGES	DRAWN A R TEPPER	DATE	WAVETEK SAN DIEGO • CALIFORNIA
MATERIAL	PROJ ENGR [illegible]	10/24/94	TITLE MODEL 420-ABCD CALIBRATION PROCEDURE
	RELEASE APPROV		
FINISH AVETEK PROCESS	TOLERANCE UNLESS OTHERWISE SPECIFIED .XXX ±.010 ANGLES ±1° XX ±.030		
	DO NOT SCALE DWG	MODEL NO. 420	DWG NO. A420-506 REV B
	SCALE	CODE IDENT 23338	SHEET 1 OF 8

Preliminary Connections:

1. Transmitter J2 to Receiver J1.
2. Transmitter output to receiver input and monitor with distortion analyzer (H/P 334A) and counter (Dana 8110).
3. Analyzer output to scope.
4. Transmitter and receiver attenuators at zero unless otherwise noted.

NOTE: Before connecting power, switch 115/230 switch on and off at least ten times.

I. "Cal" OdBm, 1000 Calibration

Depress the "Cal" buttons, also receive impedance and transmit impedance to 600Ω . Adjust R11 for 1000 Hz ±2Hz output frequency. Adjust R5 for 0.775 V-rms output voltage (OdBm ±.1dB)

II. Transmit Level, Calibration

Transmitter:		Receiver:	
SWEEP MODE	- MAN	STATUS	- OPER
SWEEP RANGE	- 5KHz	SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- TRAN LEVEL	CAL/MEASUREMENT	- REC LEVEL
TRANSMIT IMPEDANCE	- 600Ω	RECEIVE IMPEDANCE	- 600Ω

Set Frequency Dial to 1000Hz.

a) Adjust R2 for 0.775 V-rms (OdBm ±.1dB) output voltage
b) Switch Transmit Level, Fine to -10 dBm and adjust R7 for 0.245V rms (-10dBm ±.1dB) output voltage

Repeat a and b to achieve maximum accuracy.

Switch TRANSMIT IMPEDANCE TO 900Ω and RECEIVE IMPEDANCE TO 900Ω . Assure that TRANSMIT LEVEL, FINE is in the 0 dBm position. Adjust R1 for .950 V-rms output voltage.

Please refer to page -8- for further information. (420-S-399)

III. Frequency Dial Calibration; Transmitter Section

Transmitter:		Receiver:	
SWEEP MODE	- MAN	STATUS	- OPER
SWEEP RANGE	- 5KHz	SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- TRAN LEVEL	CAL/MEASUREMENT	- REC LEVEL
TRANSMIT IMPEDANCE	- 600Ω	RECEIVE IMPEDANCE	- 600Ω

Set frequency dial to 5KHz position (outer dial scale) and adjust R13 for 5KHz output frequency ±10Hz. Set frequency dial to 50Hz position and adjust R10 for 50Hz output frequency ±2Hz position (inner dial scale). Adjust R14 for an output frequency of 15KHz ±50Hz.

IV. IMPEDANCE calibration

Transmitter:		Receiver:	
SWEEP MODE	- AUTO	STATUS	- OPERATE
SWEEP RANGE	- 5KHz	SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- IMPEDANCE Z X 1	CAL/MEASUREMENT	- IMPEDANCE

Terminate Transmitter output in 600Ω ±1% resistive load. Vary R4 (Transmitter Main Bd) until displayed sweep lies along the 600Ω vertical scale line. ± 5%

Check Multipliers: Z X 2 with 1.2K ± 5%
Z X 5 with 3K ± 5%
Z X 10 with 6K ± 10%

V. RETURN LOSS calibration

Transmitter::		Receiver:	
SWEEP MODE	- MAN	STATUS	--OPERATE
SWEEP RANGE	- 5KHz	SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- RETURN LOSS	CAL/MEASUREMENT	- RETURN LOSS
TRANSMIT IMPEDANCE	- 600Ω	RECEIVE IMPEDANCE	- 600Ω

Set frequency dial to 1000Hz

Assure that shorting bar across COMPROMISE NETWORK terminals is in place. Remove any termination from Transmitter output. Adjust R3 to 1.945V rms (Transmitter Main Bd).

A. Place sweep mode in "Auto"
Remove shorting bar across compromise network.
Place 600 across "Precision Network"
Place 900 across transmitter output
Place transmit level, coarse to +10DBM, and check that trace appears at -4.5DBM.

VI. Transmitter Sine Distortion

Transmitter:		Receiver:	
SWEEP MODE	- MAN	STATUS	- OPER
SWEEP RANGE	- 5KHz	SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- Z X 1	CAL/MEASUREMENT	- Z
TRANSMIT IMPEDANCE	- 600Ω	RECEIVE IMPEDANCE	- 600Ω

Place 600Ω resistive load across transmitter output.
Set Frequency Dial to 50Hz.
Adjust R116 to remove any distortion (notch) from sine wave viewed at scope. For test sets without R116, use R-6 to remove notch from sine wave. Do not readjust in following sine wave distortion calibration.

Transmitter:		Receiver:	
SWEEP MODE	- MAN	STATUS	- OPER
SWEEP RANGE	- 15KHz	SWEEP RANGE	- 15KHz
CAL/MEASUREMENT	- TRAN LEVEL	CAL/MEASUREMENT	- REC LEVEL
TRANSMIT IMPEDANCE	- 600Ω	RECEIVE IMPEDANCE	- 600Ω

Set frequency dial to 15KHz position. Vary R6, R8 and R12 for minimum output distortion at 15KHz output frequency. (NOTE: Varying R8 will cause slight shift in output frequency. This may result in a momentary off scale reading when using the H/P 334A Distortion Analyzer or similar equipment. It is best therefore, to vary R8 in small increments and to wait for the analyzer to settle on the new output frequency). Set the frequency dial to 150Hz and adjust R9 for minimum output distortion Repeat this procedure for 15KHz and 150Hz until minimum output distortion is achieved. Typically distortion is less than .5% and must be less that 1.0%. Recheck step I.

VII. Vertical Deflection Calibration, Receiver section

Transmitter:		Receiver: R	
SWEEP MODE	- AUTO	STATUS	- OPERATE
SWEEP RANGE	- 5KHz	SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- TRAN LEVEL	CAL/MEASUREMENT	- REC LEVEL
TRANSMIT IMPEDANCE	- 600Ω	RECEIVE IMPEDANCE	- 600Ω

Display shoudl be a straight sweep parallel to the vertical scale lines. If necessary, rotate deflection yoke on neck of CRT to achieve proper orientation of scale and displayed sweep.

a) Set TRANSMIT LEVEL to -20dBm and adjust the vertical position control located on the Receiver front panel until the displayed sweep lies along the -20dBm vertical scale line.
b) Set TRANSMIT LEVEL TO 0dBm. Vary R4 (Receiver Main Bd) until displayed sweep lies along the 0dB mertical scale line.
c) Repeat a and b until the 0dB and -20dB points are accurately calibrated. The 0dB point should be within .1dB. Recheck step I.

VIII. Horizontal Deflection Calibration, Receiver section

Transmitter:		Receiver:	
SWEEP MODE	- MAN	STATUS	- OPERATE
SWEEP RANGE	- 5KHz	SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- TRAN LEVEL	CAL/MEASUREMENT	- REC LEVEL
TRANSMIT IMPEDANCE	- 600Ω	RECEIVE IMPEDANCE	- 600Ω

a) Set frequency dial to 1000Hz and vary the horizontal position control (Receiver front panel) until displayed spot lies on the 1000Hz horizontal scale line (5KHz range).
b) Set frequency dial to 5KHz and vary R2 (Receiver main bd) until displayed spot lies on the 5KHz horizontal scale line (full scale).
c) Repeat a and b as necessary to achiev
accurate calibration.

d) Set Transmitter and Receiver SWEEP RANGE controls to 15KHz range. Set frequency dial to 14KHz and vary R3 (Receiver Main bd) until displayed spot lies on the 14KHz horizontal scale line (full scale).

IX. SWEEP RANGE Calibration

Transmitter:		Receiver:	
SWEEP MODE	- AUTO	STATUS	- OPERATE
SWEEP RANGE	- 5KHz	SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- TRAN LEVEL	CAL/MEASUREMENT	- REC LEVEL
TRANSMIT IMPEDANCE	- 600Ω	RECEIVE IMPEDANCE	- 600Ω

Vary R2 and R3 on Transmitter Sweep generator board to achieve 50Hz to 5KHz sweep width as observed on the Receiver display. (NOTE: Sharp dip at low frequency end of display may occur for frequencies less than 50Hz. Proper adjustment should allow for no more that 0.5dB dip at low frequency end of display.) Set Transmitter and Receiver SWEEP RANGE controls to 15KHz. Vary R1 on Transmitter and Receiver SWEEP RANGE controls to 15KHz. Vary P1 on Transmitter Sweep generator board to obtain full scale sweep width.

X. Peak Detector Symmetry, Receiver section

Transmitter:		Receiver:	
SWEEP MODE	- AUTO	STATUS	- OPER
SWEEP RANGE	- 5KHz	SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- TRAN LEVEL	CAL/MEASUREMENT	- REC LEV
TRANSMIT IMPEDANCE	- 600Ω	RECEIVE IMPEDANCE	- 600Ω
TRANSMIT LEVEL, COARSE	- -30 dBm	RECEIVE LEVEL, COARSE	- OdBm
TRANSMIT LEVEL, FINE	- OdBm	RECEIVE LEVEL, FINE	- OdBm

Check for solid trace.
Advance transmit level, fine to -1dBm.
Check for intermittent trace.
Adjust R1 (Receiver main db) to achieve above conditions.

XI. Impedance Compare (C Option)

Transmitter:		Receiver:	
SWEEP MODE	- AUTO	STATUS	- OPER
SWEEP RANGE	- 5KHz	SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- Z X 1	CAL/MEASUREMENT	- Z
TRANSMIT IMPEDANCE	- 600Ω	RECEIVE IMPEDANCE	- 600Ω

Place 600Ω resistive load across transmitter output. Place 900Ω resistive load across Z compare. Turn Z compare switch to "on" position. Check for alternate traces at 600 and 900Ω lines. Place Z compare switch to "Identify" and check that solid trace appears on 900 line and dashed trace appears on 600 line. Reverse resistive loads and repeat above procedure checking for reversal of solid and dashed traces.

XII. Signal Frequency Suppression (Option)

Transmitter:		Receiver: STATUS	
SWEEP MODE	- MAN	STATUS	- OPER
SWEEP RANGE	- 5KHz	SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- RETURN LOSS	CAL/MEASUREMENT	- RETURN LOSS
TRANSMIT IMPEDANCE	- 600Ω	RECEIVE IMPEDANCE	- 600Ω

Set frequency dial to 2450Hz and adjust R14 (Freq. Supp. Bd.) for sharp signal drop (bottom of screen).
Set frequency dial to 2750Hz and adjust R10 (Freq. Supp. Bd.) for sharp recovery of signal level.

XIII. NOISE SET calibration (A Option)

Transmitter:		Receiver:	
SWEEP MODE	- MAN	STATUS	- OPERATE
SWEEP RANGE	- 5KHz	CAL/MEASUREMENT	- NOISE
CAL/MEASUREMENT	- TRAN LEVEL	NOISE ATTENUATOR	- 85dBrn**
TRANSMIT IMPEDANCE	- 600Ω	NOISE IMPEDANCE	- 600Ω
TRANSMIT LEVEL, COARSE	- OdBm	NOISE FILTER	- 15KHz
TRANSMIT LEVEL, FINE	- 5dBm	RESPONSE	- NOISE

Set frequency dial to 1KHz.
a) Vary R-3 on Noise board until displayed spot lies on the Odb vertical scale line +.5dB.
b) Switch Noise Filter to"C" position and vary R-4 until displayed spot lies on the OdB vertical scale line (+.5db)
c) Switch NOISE IMPEDANCE to 900Ω and NOISE FILTER to 15KHz position. Switch TRANSMIT IMPEDANCE to 900Ω.. Vary R-2 until displayed spot lies on the OdB vertical scale lines (±.5db)
d) 1. Switch TRANSMIT IMPEDANCE and NOISE IMPEDANCE to 600Ω.
2. Switch TRANSMIT LEVEL COARSE to -40DBm
3. Switch NOISE ATTENUATOR to -45DBm by extending -40DBrn button. The spot should lie on OdB line ±1db.
4. Repeat steps 2 and 4 for -20 DBRn, 10DBRn and -5DBRn.

XIV. Buildout Capacadance Check (D Option)

Transmitter:		Receiver:	
SWEEP MODE	- AUTO	STATUS	- OPERATE
SWEEP RANGE	- 5KHz	SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- RTN. LOSS	CAL/MEASUREMENT	- RTN. LOSS
TRANSMIT IMPEDANCE	- 600Ω	RECEIVE IMPEDANCE	- 600Ω

Remove jumper across precision network on transmitter.
Place test capacitance box across transmitter output.
Switch capacitance buildout switch to on.
Select buildout capacitance with thumb wheels on transmitter and make same selection on test capacitance box.
Reduce receiver level to achieve a null (lowest useable position of sweep) any mismatch of buildout capacitance and test box capacitance should result in the sweep moving upward, at very low capacitances, the receiver level may have to be readjusted.

**(All Depressed)

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Check all combinations of buildout capacitance in the above manner.

XVI. Procedure for testing the holding coils.

1. Connect 142 to transmitter output as noted through test box, Fig1 tran. power off.

2. Set 142 for max output at 1KHz.

3. Observe input to 420 transmitter with holding coil "in" and "out". Power off, output impedance 900

4. Repeat 1-3 above for receiver..

XV. Battery Low Indicators Check (B Option)

Place jumper across R-12 of transmitter battery ass'y and verify that battery low lite blinks.

Repeat above for receiver.

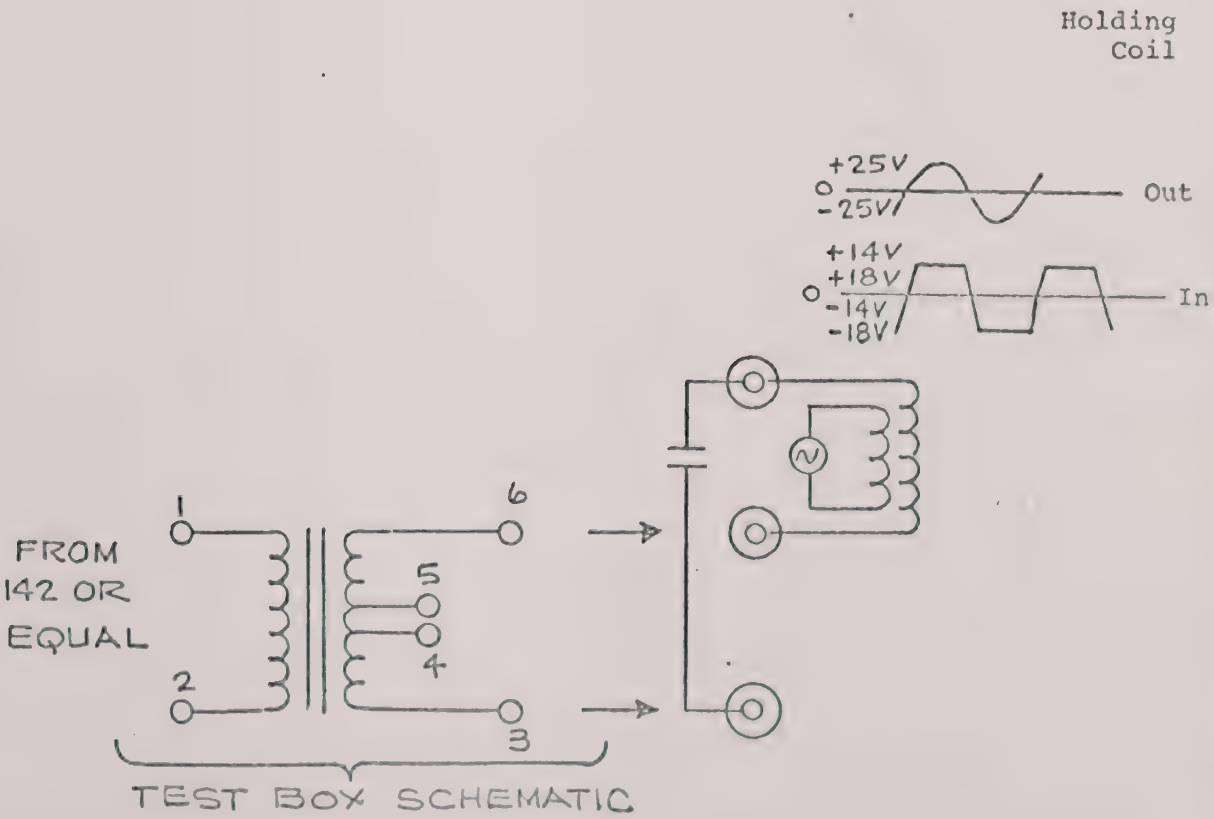

FIGURE 1

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IIa. Transmit Level, Calibration (72Ω Transmitter Termination only)
Disconnect transmitter output from receiver and terminate transmitter in 72Ω ±1%.

Transmitter:

SWEEP MODE	- MAN
SWEEP RANGE	- 5KHz
CAL/MEASUREMENT	- TRAN LEV
TRANSMIT IMPEDANCE	- 72Ω

Set frequency dial to 1000Hz
Adjust R114 for 0.268 V rms

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